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MOTORCYCLIST

Motorcyclist

U.K. 50p 02179 FEBRUARY 1975 $1.00

'75 HONDA MT250

Japan's Best Enduro says Dave Ekins

The Real Thing! LAVERDA 750 SFC

Street Legal Racer

Tech Report:
160 mph BMW 750

How-to:
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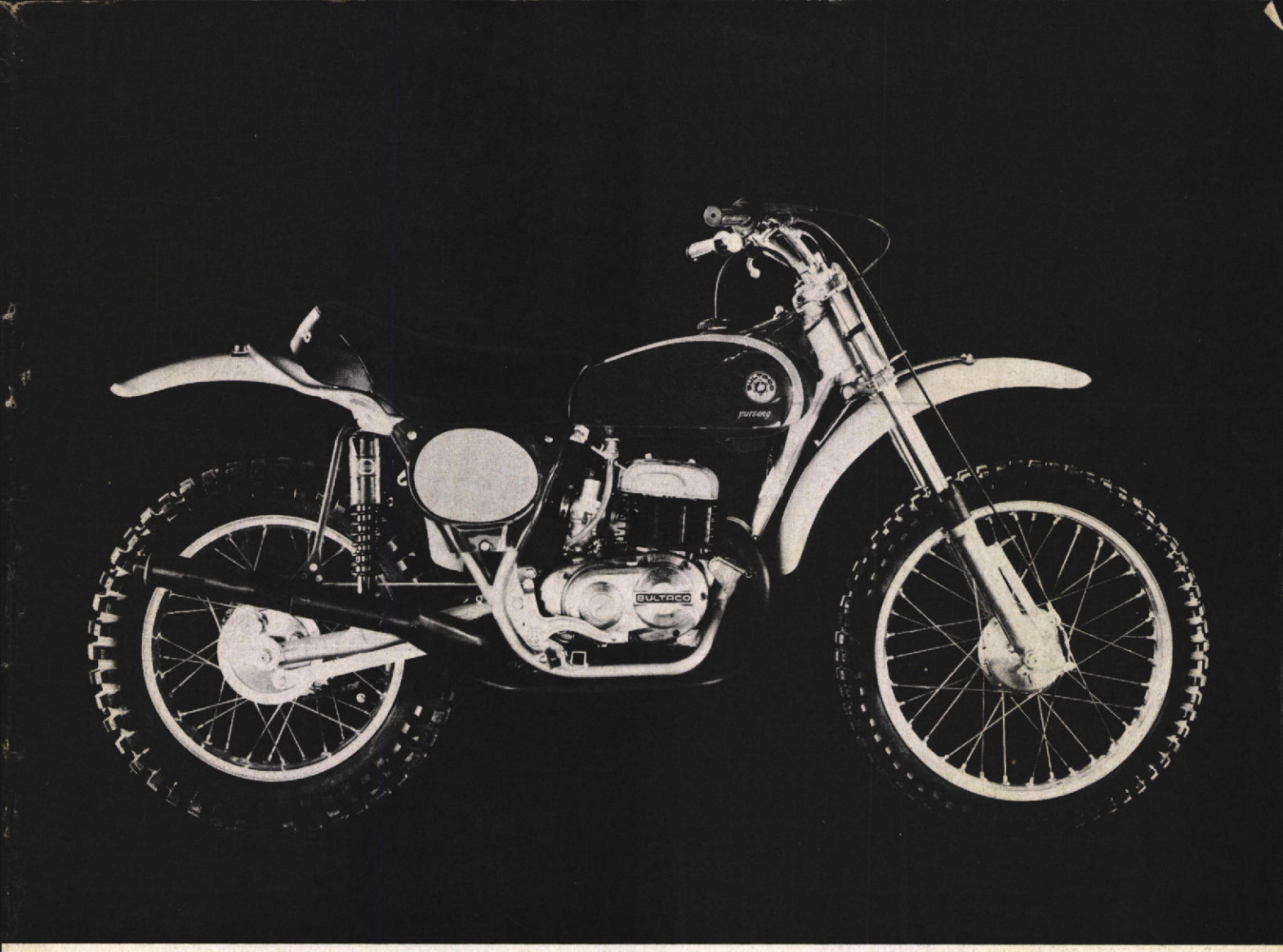

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murphy's lore

Just like all election days, there are those of you too lazy to get up off your Honda and vote. While our ALL STAR AWARDS ballot may not be as important as many other ballots you're asked to cast, it is a whole lot easier. All you have to do is turn to page 74, put a check next to your choice in the various categories and drop the whole lot in the mail. We'll do the rest. We'll count the ballots, announce the winners and, with the help of some generous industry sponsors, present each winner with approximately $1000 worth of apparel and merchandise.

Unlike most awards in the world of sports competition, the ALL STAR AWARD winners are selected by Motorcyclist readers; not by self-appointed experts or committees. The individual winners are the ones that you, the public, feel are deserving of being called tops in their particular field. Not necessarily the most successful or the highest paid, but the best. To many recipients that's as big a thrill as winning a title through more victories than anyone else.

"ALL STAR winners are selected by MOTORCYCLIST's readers, not by self-appointed experts."

Already we've received thousands of ballots and are in the process of tabulating them. Next month we'll list the four finalists in each of the seventeen categories. And, like last year, the actual winner in each category will remain a secret until the gala awards banquet on Friday of Daytona race week.

Last year's attendance topped 400, overflowing the grand ballroom of the beachfront Americano hotel. This year, with the expanded list of categories and already high volume of ballot returns, we're anticipating turnaway crowds. And why so many? Simply because, like you, they want to pay tribute to the giants of motorcycle sport. Honor the men who excel in the sport we all love. Join with them and cast your vote right now.

Tony Murphy—Editor

Motorcyclist

PUBLISHED MONTHLY • No. 932 • FEBRUARY 1975

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Bob Greene/Executive Editor • **John Weed**/Senior Editor
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cover

In one year, Honda has taken the relatively mild MT 250 enduro and made it into a potential winner. Read Dave Ekins' in-depth test on page 30. Photography by Mike Parris

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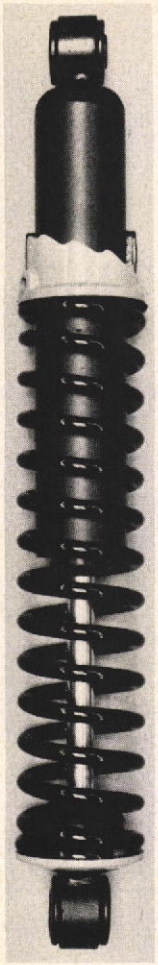

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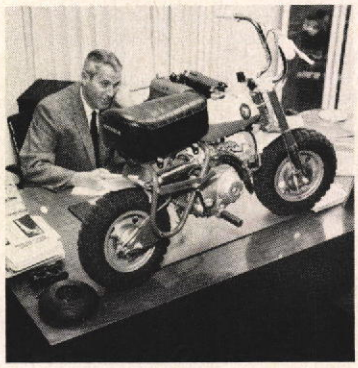


The shoe tops have turned from shiny bright to rawhide from rowing that flonky shift lever. Glasses are pitted and etched from sand blowing off those topless dump trucks. And there isn't a pair of cherry pants remaining in the closet without a ruptured inseam from spreading over the various and sundry saddles they keep stuffin' between your legs. Still there's this feeling of obligation stacked on top of a lifelong desire to keep herdin' those cotton-pickin' scooters to work every day rather than that posh 440 Charger or 352 Ranchero complete with fireplace and hi-fi. It rains, you swallow a lot of other people's spit, the cleaning bills get heavy, and the lady at the dry goods store suspects your wife's hoarding thread.

Don't get me wrong; I love it. It was a way of life long before this ol' hound came to Petersen, and will remain so until he packs it in. Part of the job? You bet, but you wouldn't think so to look at Motorcyclist's parking lot—van and pickup city. For "we," like the vast majority of motorcycle enthusiasts, still refuse to accept the fact that the energy crunch exists despite the truth. Petroleum engineers warn that the end is

"... the ignorant skeptics boo the facts, gas their big V-8's and roar off in a cloud of blue smoke."

now clearly in sight and that come the year 2020 those of you remaining will have to hang up your bars—out of gas. In the face of their superior knowledge and the fact that they are chagrined to admit the demise of their very own industry and livelihood, the ignorant skeptics boo the facts, gas their big V-8's and roar off in a cloud of blue smoke.

It's 44 miles to work, lunch and back home; the bike does it on a gallon, the car gulps four gallons running over the same course. The cycle hoards three gallons a day, 15 gallons a week. That's a net of 780 gallons a year in the bank, or enough to fuel almost four year's worth of 2200-mile round trips to Pendleton and back, site of the Greene's annual vacation, in the family sedan.

Bent out of shape? Me? Yeah, a bit. When I speculate that my son, who also bikes to work daily, will be one of those who have to kick the habit before he's through, and that his first begotten will barely get started before The Day, the whole unnecessary mess does begin to wear on my sense of fairness to the young generation and their counterparts still down the road.

Or could it be even more deep rooted than that, actually a purely selfish motivation rather than one of benevolence? Maybe it's the crushing realization that the gang I ride with—as talented and as wonderful as you are—turned your back on the bike the first time it needed you, the only time it had a chance to prove its merit by saving a nation in bad trouble. I really believed that the motorcycle was something durable that would run forever, as a sport machine or viable daily transportation. Not just another cheap thrill.

Maybe I was wrong.

Bob Greene—Executive Editor

(advertisement)

THE HONDA REPORT

February, 1975 HR #14

© 1975 American Honda Motor Co., Inc.

Mike Bell Captures Number One CMC Plate on 125cc Honda Elsinore.

Riding a Honda 125cc Elsinore™, 17-year-old Mike Bell, a La Habra, California high school senior, took the 1974 number one plate in the Southern California region of the Continental Motosport Club 125cc Pro Class Competition. Mike raced in the year-long rivalry – often as many as four races a week – until he had built up an insurmountable lead with two months of racing still left in the season. Mike continued to race, completing over 150 races in all and demonstrating a consistent winning pace that is not likely to be soon eclipsed. Mike also scored another impressive victory when he took second place in the special high school race at the Superbowl of Motocross, being barely edged out of first place by Team Honda rider Marty Smith (who also raced a 125cc Elsinore). Mike's big score in the CMC championship is reason to look for more news about this young up-and-winning motocrosser.

The Fabulous GL-1000. It's a Bike Worth Waiting For.

You've heard about the big new Honda motorcycle – the GL-1000 – and by now you're reading test reports from independent sources. All of these reports echo the same thought. The GL-1000 is a big advance in motorcycle engineering. Test riders are impressed by its quietness, response and ride. Some have called it the ultimate motorcycle. And so perhaps will you. Look for it soon at your Honda dealer's.

New Honda Motorcycles to be on Display Near You.

Demand for the 1975 motorcycles may have prevented you from seeing all of them "in the flesh." Well, until they all arrive at your local Honda dealer's—which won't be long—take advantage of a full view of the lineup at one of the many cycle shows slated to appear around the country. Honda has scheduled over a dozen major exhibitions in the coming months. You can see many of the new models, including the brand-new CB-400F, the elegant CB-500T, the quick CR-125M1 and lots more. Ask your local dealer for information about these shows.

Honda TL-250 and Sammy Miller Tops in Jersey Two-Day Trials.

The Trials Pride of Great Britain, Sammy Miller, has done it again in yet another major trials competition aboard a Honda TL-250. Sammy and the Honda TL-250 performed their balancing act in one of England's toughest trials meets, the Jersey Trials, beating the runner-up with a total of 44 marks lost vs. his nearest competitor's 82 marks lost – which is phenomenal, especially considering the fact that only the first three contenders finished with double-digit scores, all others finishing well into the hundreds. What makes Sammy run? Put a superstar together with a super trials machine like the Honda TL-250 and you've got a combination that's hard to beat. By the way, look for the debut of the fantastic Honda TL-250 at your Honda dealer's this spring.

CR's are sold "as is" without warranty. Team Honda bikes are factory prepared. M1 indicates model change.

on the line

You Dirty Dog!

Hey! You guys gotta far out mag. Only reason I decided to subscribe is because my dog Buster likes to sit on the how to ride dirt series—(I guess ya know what he does on that). Anyway, how bout a giant gang-bang comparison of the great 175's? Keep up the good work (yawn) Buster, get off my bike.

Stan Cochran
Mableton, GA

P.S. Hurry up, gotta catch your next mag!

If you'd get that damn dog to move his keester off the magazine you'd have seen the five-way go between the 175 Can-Am, Harley-Davidson, Ossa, Penton and Puch in the October '74 issue. Now we'll have to do it all over again!—Ed.

Yamaha Dilemma

I am the owner of a 74 Yamaha Enduro 125. How can I modify it for off-road and better trail riding? Should I remove all the weight of the electric starter? Also, do you think that knobbies and a bigger rear sprocket help?

Which bike is better suited to ride off the road: the Honda 125 MT or the Yamaha DT 125? Please help me.

A.J. Alejandro
Montery N.L. Mexico

Before you mortgage the farm, try it stock. If it feels to be in the ballpark, and you don't intend to use it for frequent street work, go the gearing and knobby route relative to your ability and local terrain. Personally, I'd fit slightly oversize Universal tires rather than knobbies on this small an engine. What you failed to mention was the most important change of all, a good set of rear shocks.

As for gearing, this is strictly personal and there's no way we can advise which cog suits your ability. Ditto for removal of the electrics. Depending upon your talent, it may or may not make any noticeable difference.

Final question: We don't have the heart to tell you.- Ed.

True Grit

I just wanted to say Hi to the man who just five minutes before the start of the Kawasaki Superbike International was sitting beside the ambulance crew when they were injecting Yvon DuHamel with Novocain. You certainly are a brave man to watch someone receiving a needle. Even braver to watch that same man go out on a race track and control a 100 horsepower machine when that man is in such an obviously unfit state to race (even if he did finish second). Maybe he was getting even more unfit because the day before he won the production race with the same hand shot full of Novocain. That win in itself should have proved how unfit Yvon was to race.

Magazine articles are legion that relate how Gary Nixon with a busted leg or Mert Lawwill with a few busted ribs rode a great race in obvious pain. Why were their efforts thought to be so great and their actions so exemplifing of the true grit that makes a great motorcycle racer?

Perhaps the reason you felt so horrified at the thought of Yvon racing with a non-feeling right hand was because with Gary Nixon laid up and out of road racing the only other real threat to Yamaha's dominance, on a legal bike, was Yvon DuHamel.

Kenny Roberts is a great and versatile racer, but he is not the best at road racing. Gary Nixon and Yvon DuHamel are, and not necessarily in that order. With Gary out and Yvon giving up because of a non-feeling right hand, Yamaha would have had no competition and probably made a clean sweep of the top finishers. At least with Yvon and Gary doing their thing there is at least some chance of seeing a legal machine in the top three.

Conway K. Vance

You missed the point. The editorial was not a personal attack on Yvon. It was critical of the AMA for allowing ANY rider to compete with a physical handicap resulting from a racing accident. Riding without 100 percent of one's faculties is dangerous. And racing can be dangerous enough as it is without the walking wounded bein allowed to compete.—Ed.

Glass Norton

I was extremely enthused by your article "Plastics for Bikes" in last month's Hot Rod, and Tony Murphy's comments in the latest Motorcyclist concerning motorcycle development.

Since my partner, Tim Collins, and I have been working in these directions I thought you might like to see the results of our work with fiberglass as used in some new applications. Our major effort has been to develop a new style monocoque body/chassis unit which would be an improvement aesthetically as well as functionally compared to the conventional methods of construction.

Technically, the ideals of a stiffer, lower, lighter and better handling motorcycle have been achieved. The motorcycle is about 100 pounds lighter than stock and has a considerably lower center of gravity. The expected results of better handling and performance are proven in road testing.

In our monocoque, all motor mounts, shock mounts, and the steering head are moulded into the fiberglass body. Twin down tubes add support from the steering head to the front motor mount using a Norton engine. These support tubes can be eliminated in some applications such as with a Vincent or Laverda power unit. The basic design of our monocoque allows for the adaption of power packages for most superbikes. The monocoque structure increases fuel capacity to four gallons in the tank with reserve area under the seat that holds an additional two and a half gallons. Ease of maintenance is a special feature of the design: for service or repair the powerplant pivots down from the body unit or the whole body unit can be unbolted from the powerplant in a few minutes.

Gardner Martin
Watsonville, CA

Gardner neglected to include loading or impact test data based on industry bogy. Provided it's equal or better than contemporary standards, and the deterioration factor is adequate, it sounds as though he truly has something good going. We're going to keep in touch.—Ed.

Japanese Comparison

I am planning on buying a 1975 250 or 175cc motorcycle next summer. Do you plan on having comparison tests or just separate ones on the 1975 bikes (175 or 250)? If so, are they going to be on the top four (Honda, Yamaha, Kawasaki and Suzuki? I am interested in only the enduro bikes because I will be riding mostly off-road. Thank you.

Richard Block
Interlachen, Florida

Don't we always? Hang in there; Motorcyclist is the Gang Bang specialist.-Ed.

Pat for Patton

I was extremely pleased to see Tom Patton get some of the recognition he justly deserves in your November issue. I like to consider Tom a close personal friend of mine, and having known him is a distinct pleasure.

You only forgot one thing about Tom—he is really just one hell of a fine guy, about the nicest I know in the industry! (He also works with about the finest company in the industry too!) Thanks!

John McAlpine
Nashville, Tenn.

Sprocket Info

In May '74 I purchased a Honda MT 125. I immediately realized the need for some work on gearing so that's what I'm writing about. In your August issue your 13 Enduro bike comparison test caught my eye, really the only reason I bought the magazine. But anyway in your article you said "We did some playing with sprockets, and by the time we got it to where you didn't have to slip the clutch on a hill, it was screaming at high speed." OK, MC, all of us owners out here want to know what you did.

Paul Phillips
Paolo, Kansas

We finally settled for installing a countershaft sprocket with one less tooth.—Ed.

Pretty Sneaky

I like that article "1975 New Model Sneak Preview" in the September '74 issue. It is nice to know what will come out of the 1975 factory line. It does seem like you left out something though, like Honda's new JX 125 road bike. It's a twin cylinder overhead cam four-stroke and looks almost exactly like the CB 200, and Suzuki's GT 125 twin looks like the GT 185. I'm not saying you made a mistake. I just thought you'd like to know.

Ricky Ardila
Gretna, Louisiana

This summer I bought myself a MT 250 Honda Elsinore. Expecting it to live up somewhat to the name Elsinore I was greatly disappointed. The bike runs like a 175. Have you any knowledge of any kind of kit to make the bike perform? Why not do an article on the MT 250. Thank you.

Craig Johnson
Jackson, Mich.

Read on Craig.—Ed.

A Knobby Question

I am a faithful reader and subscriber of Motorcyclist Magazine. I am also the owner of one of the most powerful dirt bikes on the market. On the other hand it is the poorest handling piece of junk I have ever had the misfortune of owning. As per your article in the March issue of your magazine "Project Bike Suzuki TS-250" I agree with you 100%. Why would Suzuki make two different suspension systems for the TM and TS series?

I am in the process of changing over my TS 400 to a decent handler by the use of TM fork springs and rear shocks. I am also going to a 14 tooth countershaft sprocket over the stock 16 tooth.

In your parts list you chose the Cheng Shin knobbies as a good move. Where did you buy these for the prices stated? I would like to get the same combination but have been unable to find them. Also would the TS 400 accept a 4.35 or 4.50 x 18 knobby? Any further suggestions you may have for my bike will be greatly appreciated.

You have a well rounded magazine going for you. Keep up the good work.

Charles D. Wise
Splights Town,
Barbados, W.I.

CHENG Shin tires are stocked by most shops that specialize in off-road machines and accessories. You will have to measure the rear sub-assembly, including sing-arm width, fender width and possible maximum chain adjustment to see if there is ample room for the larger section tire.—Dave Ekins

Budding Evel

Your magazine is the most informative to the motorcycle world. You have the most and best articles on four stroke preparation for racing. I race enduros with Honda XL 250 and SL 100 and win with both.

In your November issue on pages 74 & 75 you have the article "How to Ride over Ledges". I disagree, I think it would be easier to lift the front wheel and jump the ledge then ride off. It seems faster and easier.

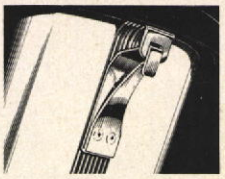
Michael L. Schock
Little Rock, Ark.

I've got to agree with you to a point. However, this How To Ride series is for off-road beginners and novices. Obviously, with you being a winner of enduros your riding skills are above those for whom these articles are intended for.

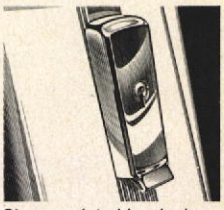
In the November issue the drawings show a shorter ledge than the story tells about. We mention ledges that are equal to your wheelbase or longer.

continued

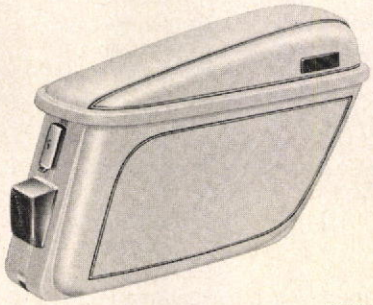
Bates Bags... get something nice going on the side!



Hook and snap latch hinge.



Chrome-plated key lock.



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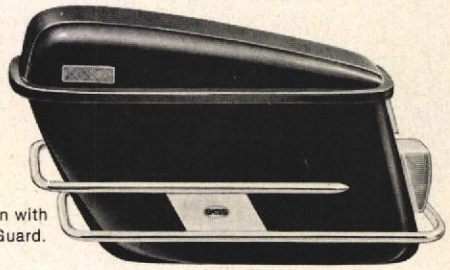

Shown with Bag Guard.

These days it's nice to have something going for you. With the styling and capacity of Bates Cycolac Saddlebags, you'll have plenty going *with* you as well as for you.

Bates Bags are better than ever. Soft inside flocking, Class A side reflectors, combination stop, tail and directional light, striping, new Bag Guards, and Custom Mounts are a few new features and changes.

Some things don't change . . . like the easy-to-care-for ABS Cycolac, the chrome-plated "draw-action" key lock for security and the hook-type hinges to hold tops in place.

So . . . get something going for you!

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With Rear Refl ☐ Std Sz—$59.50 pr ☐ King Sz—$69.50 pr ..... $ _____

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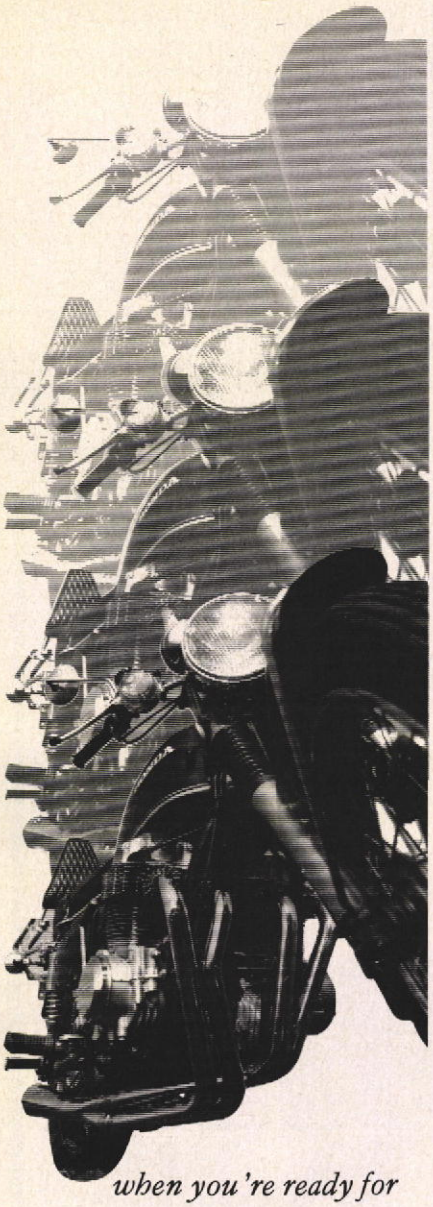
☐ $2.00—Rush me all the full-color Bates Accessory and Leathers Catalogs.



when you're ready for more bike . . . get Hooker. The sophisticated high performance exhaust system.

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HOOKER ™ HEADERS

Now if you want to take your XL250 into flight off a 4½ foot ledge you'd need to be running about 50 mph in order to land without too much of a jolt. If you lobbed it off the edge at about 20 mph while standing on the pegs the impact would probably be great enough to bend both footrests down and the handlebars. If you prefer to do it sitting then you just might end up an inch or two shorter than you currently are.

I'd prefer to tell the beginner rider to stick out both feet and slide down the embankment. I'm sure that's how Evil started.—Dave Ekins

They're Good Scouts

I have had an Indian ME-76 for two years and I think it has been quite a good bike. Although Motorcyclist has had two major tests of 125's during this time, you have ignored the 125 and the 74-76, 100, and the new Indian 175. I think a test might prove the Indians to be comparable to the Can-Ams in power and handling but at a lower cost.

In defense to the letter in the December issue, the throttle, as the other parts, seems to be of high quality and has certainly lasted well on my bike. The forks, contrary to the letter, are probably one of the best things about the bike and are certainly superior to most forks on "Enduro" bikes. That the Indian is a durable, well-handling cycle has been proven by its success in off-road racing.

Finally, when I wrote to Indian Motorcycles with a suggestion about gear ratios and a question about getting a steering lock and luggage rack, I received a quick, courteous reply answering the suggestions.

Lewis Lee Delavan
Arkadelphia, Arkansas

Look for a comparision test on the Indian in an upcoming issue.—Ed.

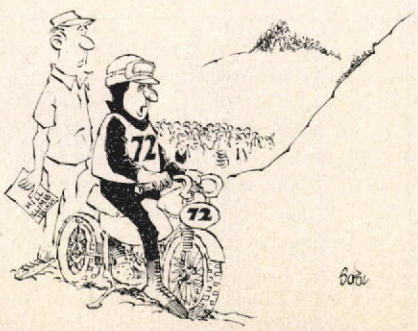
I'm In Love Again

I have found that I'm in love. On page 39 of your June '74 Motorcyclist is an "exotic specimen of geometric perfection". The picture is, of course, of the Ducati Super Sport 750 Desmo.

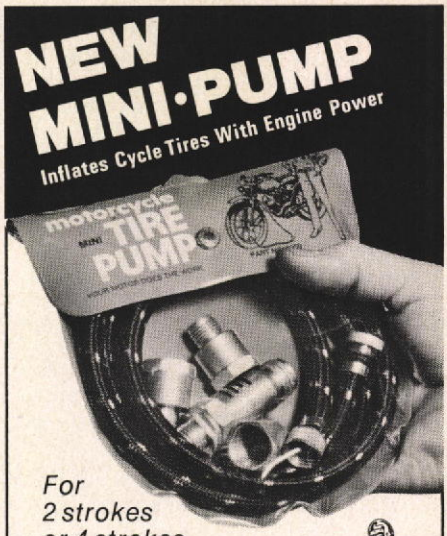
How may I get a reproduction of that page 39 in poster size?

Charles W. Neal
Van Nuys, CA

Come up with about sixty bucks. Still in love?-Ed.



"Look at them all waiting to see me make a complete ass of myself."



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The Enginair Tire Pump will fit in your pocket, yet pumps up a tire in just over a minute. Your engine does the work. Just unscrew a spark plug, insert Enginair, and idle the engine. (Use kick starter on singles.) Fits all spark plug openings. Pumps only clean, fresh air; can't harm your engine. Costs just $7.25.

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THE PRODUCT SPEAKS FOR ITSELF

AN EXPERT ANSWERS YOUR QUESTIONS ABOUT MUSCLES

Our files show that thousands of readers like yourself want to build bulging muscles and achieve real physical power like their favorite athletic champions. How to go about it? We decided to ask an expert, Dave Prowse, 3-times British Weightlifting champion and leading fitness expert. Here are his answers.

Q. *What does it take to build muscles?*

A. Basically, it takes exercise. Almost any exercise will help to develop at least some of your muscles if you keep at it long enough and hard enough.

Q. *Isn't there an easier way?*

A. Yes. There is one outstandingly effective training method that is also fast and easy—the one I use and recommend—the new Bullworker system.

Q. *What's that?*

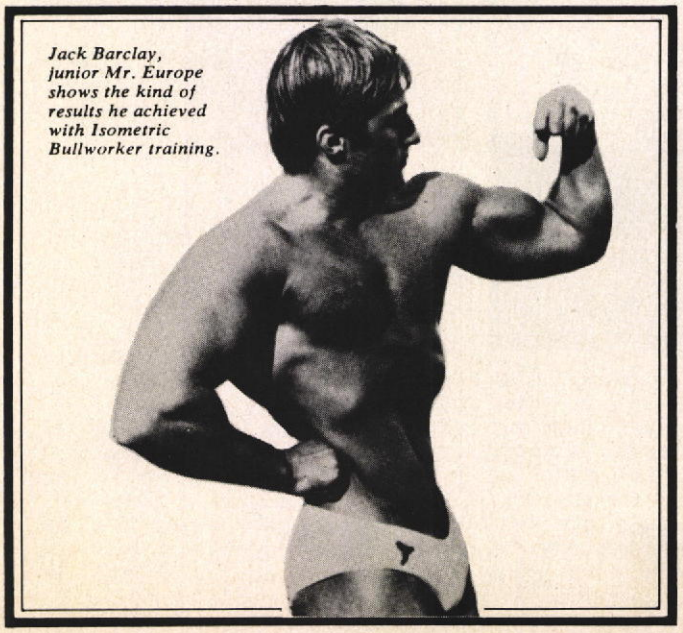
A. The Bullworker is a revolutionary new muscle-building exerciser based on Isometrics, the science that increases strength up to four times faster than conventional methods. In my opinion, it's the most advanced training system in the world today. Many leading athletes use it: World-famous Heavyweight Boxer Muhammad Ali, World Heavyweight Judo Champion Wim Ruska, and Cycling Champion Eddy Merckx, to name only a few.

Q. *How long does Bullworker training take?*

A. Bullworker provides absolutely the fastest kind of exercise possible. In fact, an introduction training program takes only 70 seconds a day. No other system—weightlifting, pulleys, or strenuous calisthenics—can give you results so quickly and easily. On the contrary, many old-fashioned methods take hours of sweaty, boring work each day... and it's often months before you begin to see improvements. Busy professional athletes and champions don't have time for that. Nobody does.

Q. *How long does it take before you begin getting results?*

A. With the Bullworker, you can actually begin to see and measure the positive results right from the very first day! Thanks to a built-in measuring device called the Powermeter. After every exercise you just check the reading to see exactly how much your strength has increased from the day before. There's no guesswork involved. Isometric Bullworker training can increase your power at the amazing rate of up to 4% per week! That means a 50% increase in strength in the first three months alone. And I've known many young men who have gone on to double and even triple their strength.



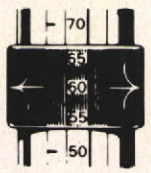
Jack Barclay, junior Mr. Europe shows the kind of results he achieved with Isometric Bullworker training.

Dave Prowse, 3-time British Weightlifting champion, demonstrates a super-effective 7-second exercise for building powerful biceps... using the new Bullworker with built-in powermeter.

Q. *What do those figures mean in visual terms?*

A. They mean that in as little as 14 days you can actually begin to *see* muscle growth in a mirror and *verify* it with a tape measure. Every week thereafter brings ever faster growth.

Built-in Powermeter
You can actually measure your musclepower g-r-o-w-i-n-g from the very first day.



Q. *But to get such impressive results, don't you have to work very hard?*

A. Absolutely not. That's the outstanding advantage of Isometric training... it's so amazingly easy! Each "Static-power" Isometric exercise takes *only 7 seconds,* and you barely have to move. It's not even necessary to disrobe. The Bullworker is so light and compact, it can be used at home, in the office, anywhere... even while watching TV! It's a great improvement over bulky, expensive weights, bicycle machines, pulleys, etc.

Q. *Can Bullworker training even develop bodies which are weak and skinny, or fat and flabby?*

A. Definitely! It's been proven by thousands of men of every shape, size and age all over the world. Bullworker training helps transform weak, thin arms into rippling, muscular pillars of strength, build broad, powerful shoulders, turn flat, shallow chests into deep, manly ones, forge loose stomach flab into steel-hard, well-defined muscle... build that "V" shape of a real athlete, develop sturdy, contoured thighs and calves.... And all this in *record time!*

What's more, I've known skinny, shy fellows who, after just a few short weeks with Bullworker, turned into real go-getters... every inch a man... bowling girls over with their dynamism, confidence, and new found power! You really have to see the remarkable effects of Bullworker for yourself to believe them!

Q. *How can our readers find out more about the Bullworker, perhaps actually try it for themselves?*

A. I understand that the Bullworker distributor in the USA is now making it available—free—on a two week home-trial basis in order to introduce it to the general public. If your readers are interested in developing their bodies, in building muscles and strength faster than ever before possible, I suggest that they contact the US distributor for full details.

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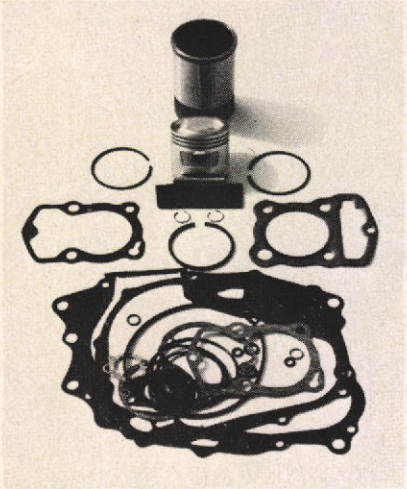
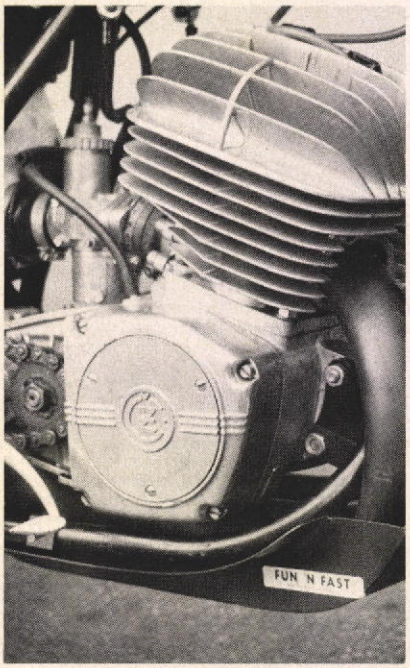
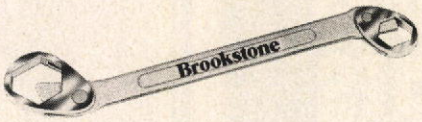


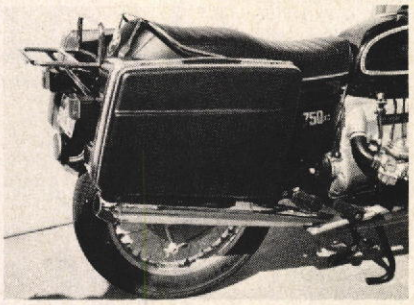
Cycle Products West offers a neat kit that will boost the Honda CB/CL/SL 100 and 125 to 150ccs. The kit consists of a high compression piston and rings, head gasket, wrist pin and clips, a special sleeve and all gaskets. In addition, they also offer a rebuilding service that will take care of bolting the whole thing together, including any machining. For more info, contact Cycle Products West, 11900 W. Pico Blvd., West Los Angeles, Calif., 90064



Fun 'N Fast, makers of a variety of skid plates, have just released a skidder for 1973 and '74 CZs. With the CZ having a somewhat vulverable pipe and case exposed to the pounding of serious off-road riding, it is a wise investment. It fits the popular 250 as well as the big 400 so contact your local dealer or write to Fun 'N Fast, 18143 Napa St., Northridge, Calif., 91324

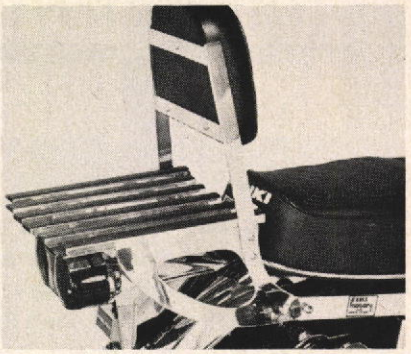


The Brookstone Company has a tool that takes the place of an entire set of wrenches. It handles all nuts and bolts ⅜" x ¾" across flats, including metric. It automatically adjusts itself and operates just like a ratchet. As it grips at least three surfaces without rounding or damaging corners, it is excellent for removing rusted bolts or those hard-to-budge knuckle knickers. Brookstone Company, 5034 Brookstone Bldg., Peterborough, New Hampshire, 03458

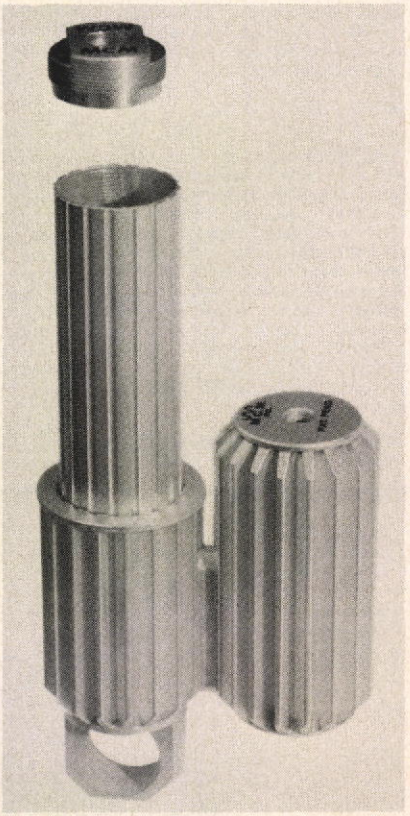


Butler & Smith Inc., importers of BMW motorcycles, are now offering high quality fairings and luggage carriers (saddlebags). The famous German made 'Krauser' cases are built along the lines of airplane touring luggage and are specially fitted to late model BeeEms. With a push button release mechanism, they are quickly detachable. Hand grips and locks are also provided. See your BMW dealer.

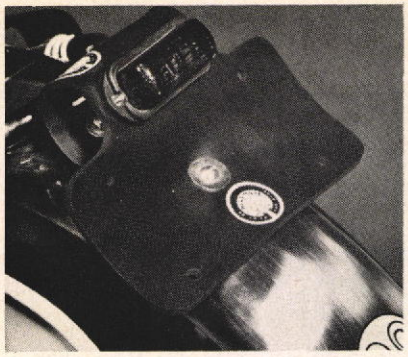
Spirit of America is marketing the all new Spirit Eagle sidecar that can fit any motorcycle frame configuration starting with the 175s. The suspension system is fitted with Boge shocks, adjustable to five different spring settings. Complete with large two-way tailight, safety glaze windscreen and upholstered bucket seat, the sidecar is available from Spirit of America, 500 S. Douglas St., El Segundo, Ca.



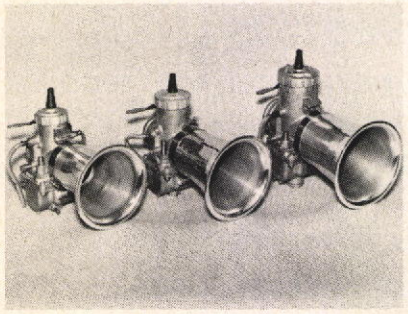
Rack Factory motorcycle racks are designed and engineered specifically for each make and model of bike. This eliminates the possibility of any modifications to the rack or the motorcycle. Weighing only four pounds, the racks are triple buffed polished and sealed with a protective coating to resist wear and the effects of the elements. For additional info, contact The Rack Factory, 729 West Anaheim St., Long Beach, Calif. 90813



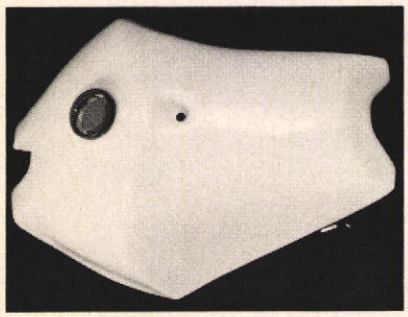
Grand Prix Cycles now have aluminum shock bodies for Konis. It utilizes more oil and the cooling ability is greatly increased. The slim design eliminates the problem of chain clearance and brake rod clearance and they can be filled through the screw type cap on the resorvoir. Available in four lengths: 11.9, 12.3, 12.9, and 13.4 inches from Grand Prix Cycles Distributing, 14240 East 14th St., San Leandro, Calif. 94578



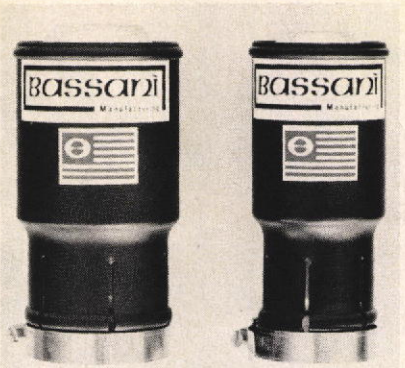
Hillmart Manufacturing has taken the worry out of taillight repairs on enduro bikes. Completely mounted in rubber, the 'Endo' unit is lighter than stock and the safety lens is less likely to crack in case of a fall. The Hillmart modification brings the basic unit, manufactured by R.E. Dietz Co., up to full international specs for serious enduro or off-road riding. The Dietz light is smaller than stock but it meets the enduro requirements. For more information, contact Box 375 GM Circle, Syracuse, N.Y. 13201



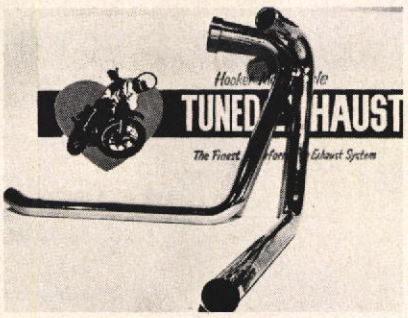
Joe Haile Engineering is offering velocity stacks to fit Mikuni carburetors. There are sizes to fit 30mm through 44mm carbs and they are made from heavy gauge spun aluminum and designed with the proper intake breathing characteristics for high performance engines. Mounting is by a simple wide band clamp and rejetting is recommended when the stacks are used. Write to Joe Haile Engineering, 4824 Arcola Ave., North Hollywood, Calif. 91601



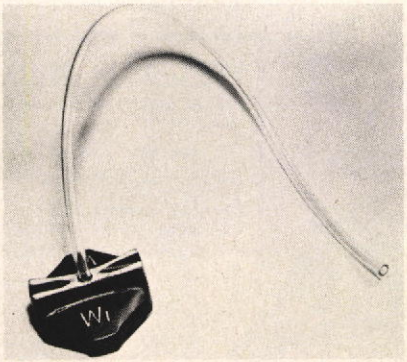
Malcolm Smith Racing Products has come up with just the answer for those long rides-a desert/enduro tank. Made from unbreakable plastic, the center universal mount tank holds 3.5 gallons and is available in red, yellow, silver and white. It will fit any motorcycle with a single backbone frame. Write Malcolm Smith Racing Products, P.O. Box 1086, Riverside, Calif.



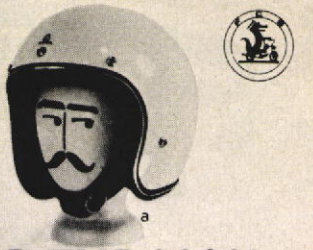
Bassani Manufacturing has a new Forestry Approved Spark Arrestor that does not cut power or restrict exhaust flow. It comes in three sizes and fits over the end of any silencer built by Bassani. Each Spark Arrestor is individually packaged and comes with all mounting hardware. For information, write Bassani Manufacturing, 3726 East Miraloma Ave., Anaheim, Calif. 92806



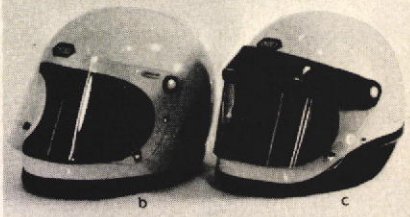
Hooker Headers offers another performance exhaust system for Honda motorcycles. The chrome TT-style pipes are of straight-through design for extra top end horsepower on the race track. A bolt-on muffler easily converts them to street use. They come complete with mounting hardware, instruction sheet and decal from your local Hooker dealer or contact Hooker Headers, 1032 West Brooks St., Ontario, Calif. 91762



Webco Inc., suppliers of all sorts of useful goodies, has just added a vented gas cap to their range. The quality aluminum casting features positive venting and easy high leverage turning. Finished in competition black anodized aluminum, this cap fits all Webco plastic tanks and most enduro motorcycles. See your dealer and ask for Webco Part No. 633 or contact Webco, 218 Main St., Venice, Calif. 90293



FOR THE MAN WHO WEARS MANY HATS



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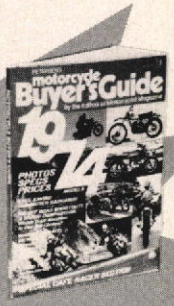

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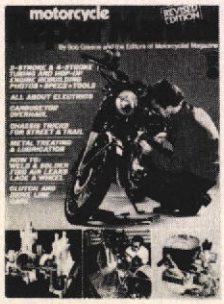

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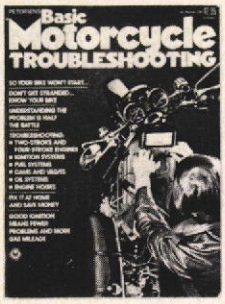
Included are chapters about tuning your bike, diagnosing your electrical system, rebuilding two and four strokes, cycle maintenance, selecting and using the right tools and more. 288 pages of fully diagramed motorcycle know-how.



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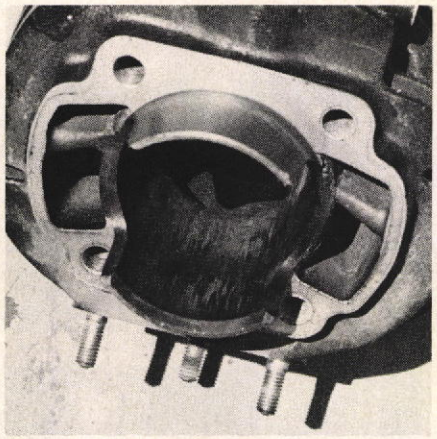
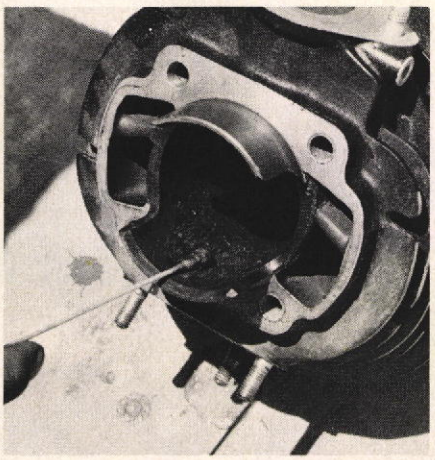
SAVE THAT BARREL

Here is a racer trick that can save you some money. Quite often when you seize a piston, a quick hone job along with a fresh piston and rings are all that's needed to get back into action. Before you can hone or rebore a



barrel that has aluminum galled into the cylinder walls, you must remove all the aluminum. Soft as it is, aluminum is extremely abrasive and in a seized barrel the aluminum is imbedded deeply into the porous surface of the cast iron. An etching job with muriatic acid is the only answer. Muriatic acid is used in swimming pools and to clean surfaces for soldering, so it is readily available at a hardware store or quite often at a drug store. Take the barrel



outdoors and protect your eyes while carefully swabbing plenty of acid on the aluminum deposited on the cylinder walls. Aluminum, being softer, will be eaten away by the acid before the cast iron is affected. When the acid quits bubbling, apply some fresh acid. When all reaction stops, the aluminum is gone. Wash the barrel in running water, and you're ready to hone or bore.

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STEVE BAST SCOOPS U.S. SPEEDWAY TITLE

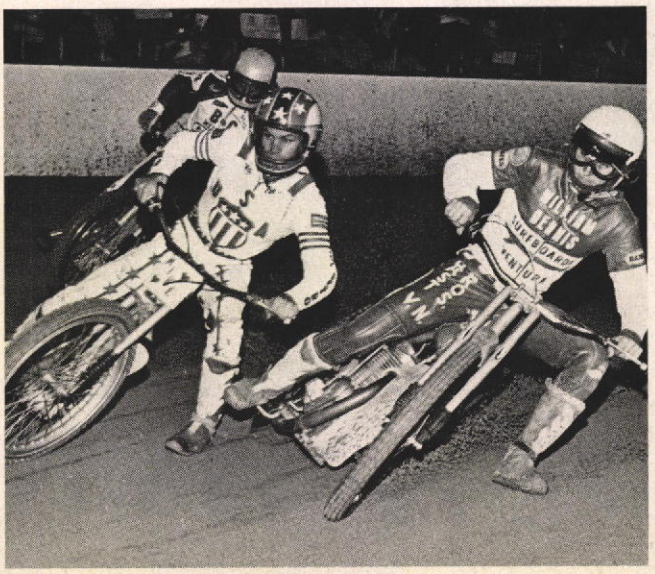
Costa Mesa, Calif.,—The 1974 speedway motorcycle racing season ended at Costa Mesa with the staging of the rain-delayed annual United States Championship. A turnaway crowd of 10,228—largest ever to witness a championship race in modern American speedway history—saw former titleholder Steve Bast wrest the crown away from his younger brother Mike in a knock-down, drag-out brawl that kept the capacity crowd glued to their seats until the final race.

Mike Bast, odds-on favorite to repeat as national champion, placed third behind his brother and 20-year-old Jeff Sexton. Sexton, a slight (5'6") former District 37 A.M.A. motocross champion, almost pulled off the upset of the year until a determined Steve Bast edged him in heat #17 of the 20-heat race. That turned out to be the deciding race of the night as Bast finished with a total final score of 13 points to Sexton's 12.

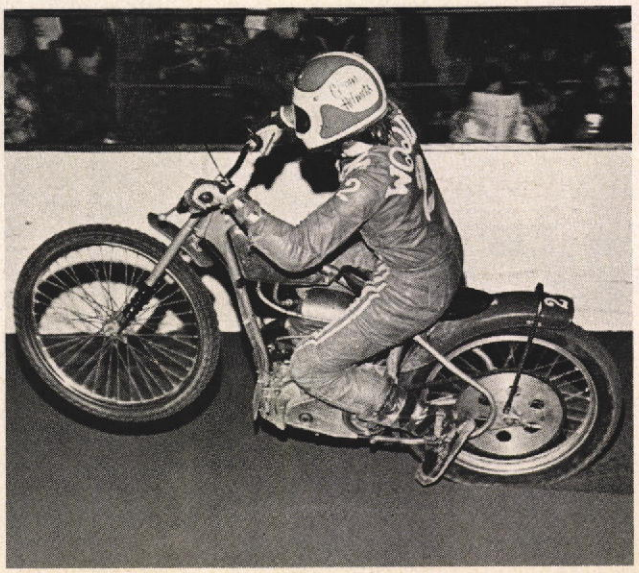
Mike Bast, Steve Bast and Jeff Sexton with their respective race queens.

On the victory stand an exhausted and drained Steve Bast summed up his feelings on his triumph: "I feel fantastic! I owe it all to my tuner, Frank, my father and the Man upstairs!"

Another former speedway champion,



Winner Steve Bast holds the inside line from brother Mike.



Former champ Rick Woods gets traction out of the last corner.

Rick Woods finished in a 5-way tie for fourth place. The turning point for the 26-year-old Woods came in event #7 when Dubb Ferrell stunned the packed stadium by defeating both Woods and Mike Bast. Woods then finished behind Steve Bast and Larry Shaw in heat #12 after Shaw demanded a restart because the motorcycles of Woods and Bast had touched the starting ribbons prior to the start in a violation of Speedway Racing Association rules.

The Woods supporters in the packed grandstands booed and jeered Shaw for forcing the restart because Woods had beaten Bast to the first turn in the false start and many felt that he then could have stopped the steamroller-like charge of Bast. Woods finished third in the heat and saw his hopes for a record fourth national title dashed.

Veteran "Wild Bill" Cody tied with Woods, Shaw, Ferrell and Sonny Nutter for fourth place in the final standings. The last heat of the night was the determining race for Steve Bast's title hopes and he watched anxiously from the pit wall as his brother, Mike, lined up against Danny Becker, Cody and Nutter. If Mike could finish first in this heat, he would pick up 3 points to tie his brother and thus force a run off for the championship. If Mike Bast finished second, it would tie Sexton's point total of 12 and also force a run off for first runnerup to Steve. Unfortunately for the many Bast supporters, Mike lost the start to the 29-year-old Nutter and, while trying to pass Cody, spun completely around on his motorcycle and finished last in the 4-man heat race.

Jeff Sexton did a fantastic job.

1974 SPEEDWAY NATIONAL CHAMPIONSHIP FINAL RESULTS

1-Steve Bast (13 points)
2-Jeff Sexton (12 points)
3-Mike Bast (10 points)
4-(tie) Rick Woods, Larry Shaw, Sonny Nutter, Bill Cody, Dubb Ferrell (9 points)
9-(tie) Larry Moon, Steve Nutter (8 points)
11-Danny Becker (6 points)
(tie) Mike Konle
13-Scott Sividge (5 points)
14-Mike Curoso (4 points)
15-Billy Gray (2 points)
16-Ed Williams (1 point)

Mike Bast pulls an outside hole shot on Curoso, Shaw and Nutter.

Eames Announces Plans For 1975 I.S.D.T.

Westerville, Ohio—Al Eames, newly-appointed competition development manager of the American Motorcycle Association, has announced the qualifying system to select the American team for the 1975 International Six Days Trial.

As in 1974, a series of two-day trials events will help determine the American entry for the ISDT. That series is expected to consist of nine events beginning in New Jersey, January 18-19.

Eames said, "The '75 system basically parallels that of last year, with a couple of small but significant changes. We will count the best four finishes rather than the best two, in an effort to place a higher premium on consistency, and we have established a manufacturers' advisory committee made up of companies committed to supporting the ISDT effort."

continued on page 57

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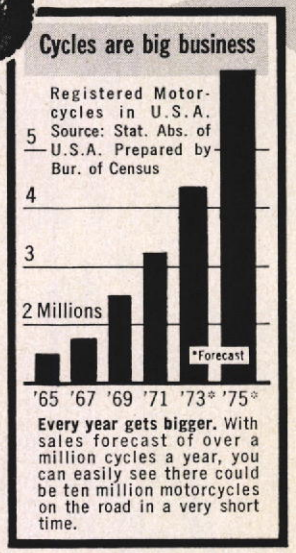
Cycles are big business
Registered Motorcycles in U.S.A. Source: Stat. Abs. of U.S.A. Prepared by Bur. of Census
5
4
3
2 Millions
*Forecast
'65 '67 '69 '71 '73* '75*
Every year gets bigger. With sales forecast of over a million cycles a year, you can easily see there could be ten million motorcycles on the road in a very short time.

Work Out of Your Home!

It's easy to get started once you qualify as a motorcycle mechanic. Just let your friends and neighbors know you're ready to repair cycles in spare time—or if you'd rather, get a full time job at a motorcycle shop or dealer.

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We send you the special cycle tools and test instruments you need. This set of precision tools is yours to use during your training...and yours to **keep** in your action-packed career. You actually learn by doing—with the tools in your hands—getting the practice you need to become an expert motorcycle mechanic.

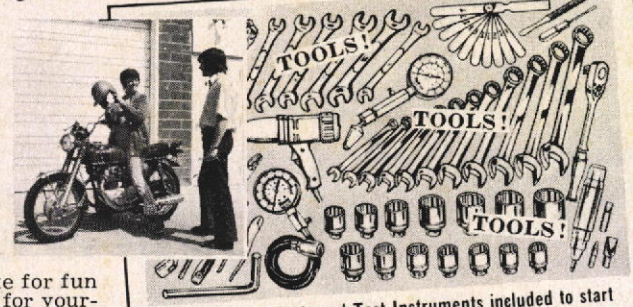
Everything is explained in easy-to-understand language, complete with drawings, diagrams and photographs. You'll learn engine design, carburetion, electrical systems...as well as how to adjust and repair frame, wheels, shocks, transmission, valves, everything you want to know from routine maintenance to a major overhaul.

Motorcycle Shops Need Qualified Mechanics

Has your bike ever been out of action waiting for needed repairs? It happens to almost everyone! It seems motorcycle shops just can't keep enough mechanics on hand to take care of everyone. Wherever you go all over this country, you'll find motorcycle shops looking for qualified mechanics...and they pay good money too!

Million New Cyclists

Motorcycle sales are going through the roof! The estimate of a million new motorcycles bought this year is probably low—and now with gasoline shortages and higher prices, you can just imagine how many people are going to be switching from automobiles to motorcycles for their regular transportation...not to mention the thousands upon thousands of new dirt bike riders who are discovering the thrills of this action-packed sport.



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More Girls – More Bikes Each Year

If you've been riding your bike for fun the past few years, you can see for yourself that more and more girls are taking up the sport. And this means more bikes every year...and a bigger demand for motorcycle mechanics. So get in on the action...get in on the fun—start making good money as a motorcycle mechanic. Rush the coupon today for free "Career Kit."

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Your future as a motorcycle mechanic is in your own hands. The big demand means you can decide for yourself whether you want to work for someone else or get into your own cycle repair business. Start in your spare time repairing cycles for friends and neighbors—or get a job with a motorcycle shop! After you've been a working mechanic, you can decide whether you want to start your own profitable repair business.

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Get all the facts now...without obligation. Be the first in your neighborhood to cash in on the big demand for motorcycle mechanics. Mail the coupon, **today sure!**

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Enjoy the admiration of friends and neighbors as they flock around to watch you tear down and tune up all kinds of motorcycles. And just think of the satisfaction in knowing you've got the best performing bike in town. Plus, you can make extra dollars fixing motorcycles for friends and neighbors.

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the achievers

Tim Witham is a behind-the-scenes type, relatively unknown to those outside of racing's inner circle. He doesn't get his picture taken in the winner's circle or his name in too many race reports, but nevertheless his efforts often contribute to those results. Tim is the W in S&W.

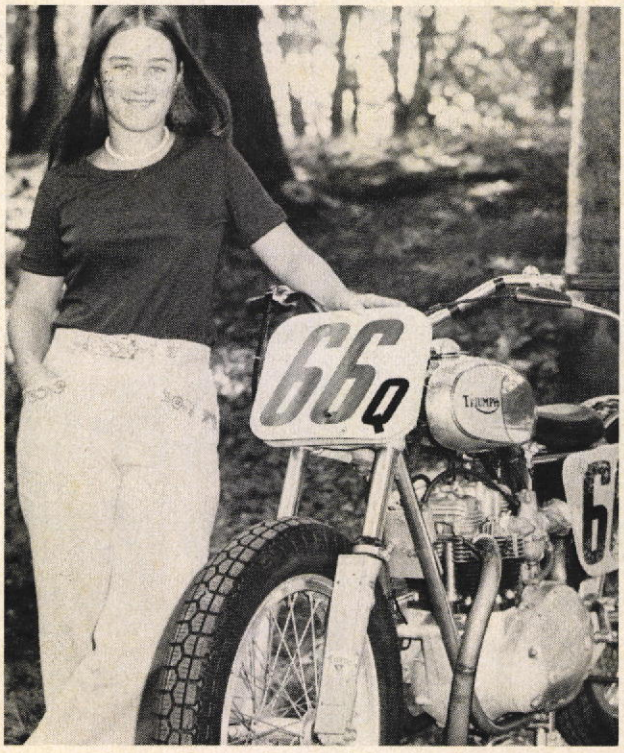
One of the most knowledgeable suspension designers in the world, his shock units are found on everything from weekend playbikes to Kenny Roberts' winning Yamahas. While not too well publicized, the rear shocks on the first two at Daytona in 1974 (Agostini and Roberts), and the first three at the season-closing Ontario 200, were S & W's, in each case custom-tuned by Tim to the riding styles of the individuals.

Strangely, Tim's life seems to have evolved in and around springs of one type or another. Two decades ago he was a tuner, preferring to work on Triumph twins and let others ride them. His reputation at the time was that of a genius since his Triumphs were always faster and ran longer than everybody elses. By the Sixties he'd eased off of the racing and was devoting his time to developing a valve spring that would benefit any and all four-stroke engines. To this day, that S&W spring represents the best available.

His interest in suspension is a rather recent one. About the time that dirt track machines switched to swing arm frames, the lack of specialized rear suspension units became apparent. Tim played with the problem and eventually undertook to design and manufacture his own units. All the while his developments were pinpointing some needed improvements in front suspensions as well. Before he knew it he was back in the spring business.

A natural wit, Tim can always be found in the midst of the hotshots, analyzing their suspension problems and offering them solutions. And should he be unable to rectify the problem he'll just cheer them up with a gag or two.

Tim Witham, one of the most knowledgeable suspension designers in the world, listens intently to Gene Romero's description of a handling problem.



Diane Cox gets ready to battle with the AMA Experts.

Few men have the drive that it takes to make an AMA National Expert, and prior to September 27, 1974 the odds of a girl breaking into big-time bike racing were ten to nothing. It was beyond stretch of the male imagination—and ego—to conceive of a member of the fair sex ever breaking into the elite club. They couldn't believe eighteen-year-old Diane Cox from Salem, Oregon. But in that historic month of September, Diane closed the gate on enough of the boys at Ascot Speedway in Gardena, California to garner her 81st national point, one more than necessary to transfer out of the Juniors and into the Experts.

Riding a 750cc Triumph twin out of Bob Strayer's Suzuki Sport Center in Salem, Oregon, Diane's unprecedented career dates back to 1966 when, at the age of ten, she and her sisters received paternal sponsorship on a trio of Honda 50's. A year later Diane was competing at the local flattrack and motocross races, and by the time she was 16 she was a Novice half-miler, accumulating enough points in a single year to transfer to the Junior Class! She won her first Junior Main a few months ago at the Sidewinders' half-mile in Clackamas, Oregon and now her fans stand engrossed in anticipation of her upcoming battles with the toughest racers in the world.

Diane's cool. Racing's fun—no more. No women's libber, she's not out to make it any battle of the sexes; just have a good time, win when you can and remain as feminine as she possibly knows how. She's a good girl and a good sport and, perhaps, someday a good National Champion. Who knows? They said a girl would never get this far, but that was before Diane.

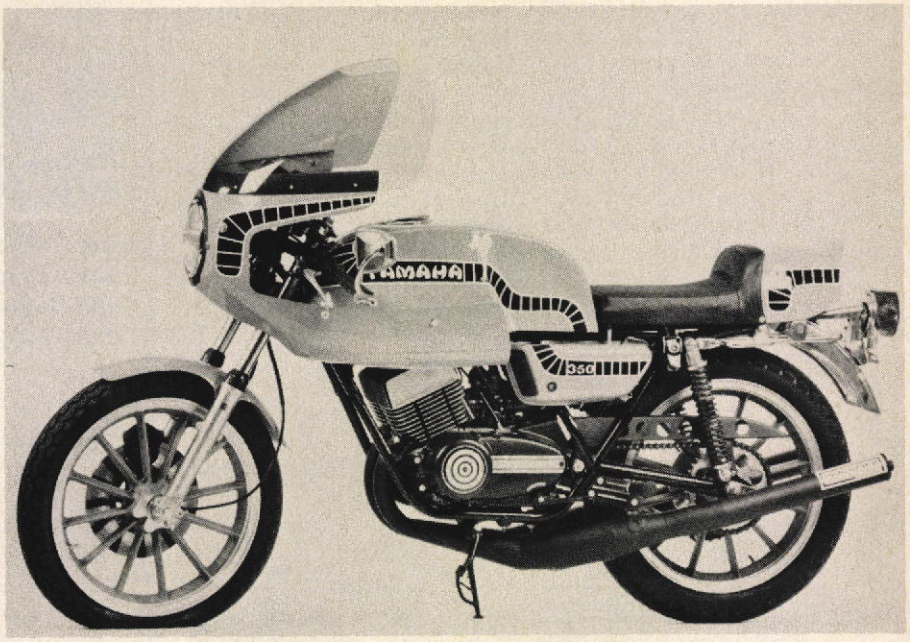
WELL DRESSED ST

With the power output of our project RD350 considerably raised (see December's issue of Motorcyclist), our next step was to give the potent little street twin a face lift. Of all the forms of cosmetic revamps, the cafe racer image is one of the easiest to achieve, especially with the abundance of goodies currently available.

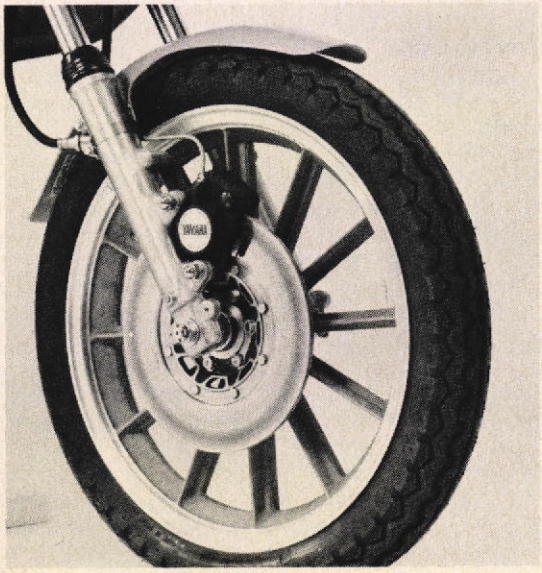
Dick's Cycle West came up with a kit that virtually changes the machine in a matter of hours. Consisting of a tank, seat, fairing, front fender, clubman's handlebars, rear-set foot pegs and tiny handlebar mirror, the kit made up the majority of the mods.

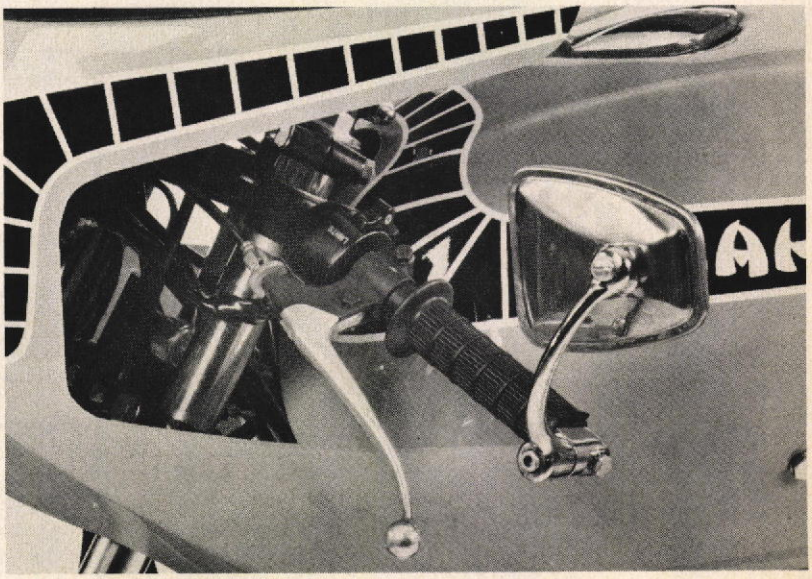
In addition, Monotrack mag wheels, distributed through Target Products, were added to enhance the running gear; and in the suspension department, Arnaco rear units were fitted. Darryl Bassani's exhaust system was called upon to handle that department, and while that may have come under the engine modifications, we felt that the cafe racer image wasn't complete without a modified exhaust. The Bassani unit not only adds to the appearance, it also kicks the horsepower in addition to being relatively quiet, as far as after-market replacement pipes go.

The front forks work quite well and were left alone, although it should be noted that the front end will start to twitch if a front fender or fork brace isn't used. The fiberglass replacement



(Right) The Dick's Cycle West fiberglass really sets the bike off. With footpegs, handlebars of your choice and cafe mirror, the kit will set you back about $450. It may seem like a lot but in the long run, it works out cheaper than buying parts individually. There are three different fairing designs to choose from which will also vary the price slightly. (Below left) The stock Yamaha disc, axle and wheel bearings work in conjunction with the Monotrack wheel from Target Products. The fender fastens with hose clamps. Braking is one of the strong points of the stock machine and with a few precious pounds shed, it performs even better. (Below right) With the Dick's kit, you can specify either clip-ons, drag bars or clubman's bars. Target also offers clip-ons for the real cafe look. Bar mounted mirror meets all legal requirements and is tucked out of the way; adjusts to a variety of positions.





TREAKER

Yamaha 350 Cafe Project Part 2: The Finishing Touches

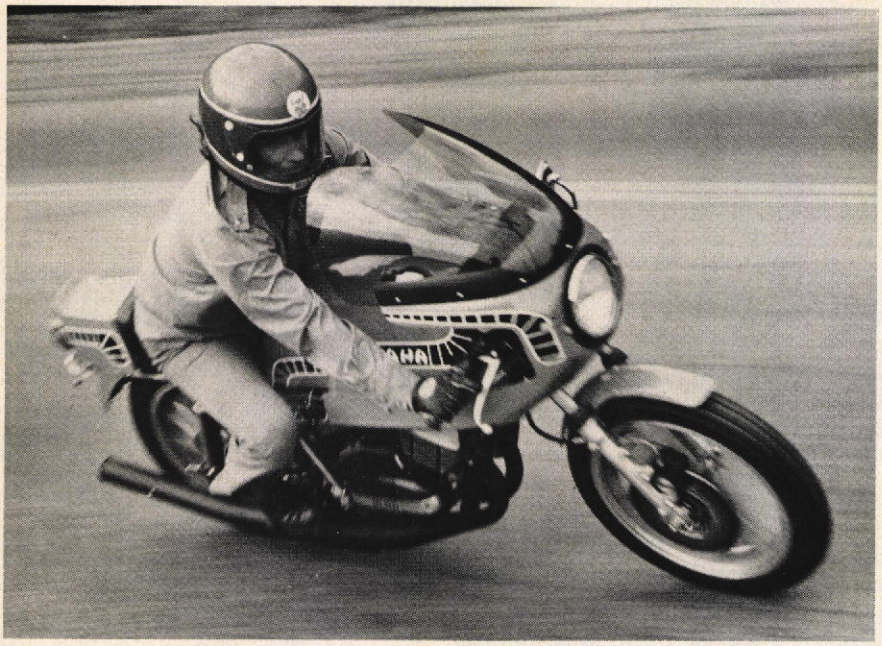
By John Weed

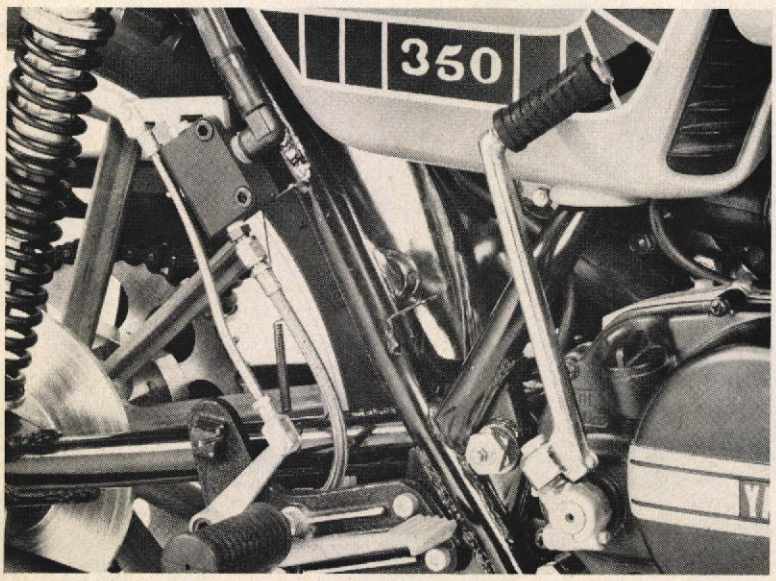
fender works fine but don't run your machine without one, at least not fast.

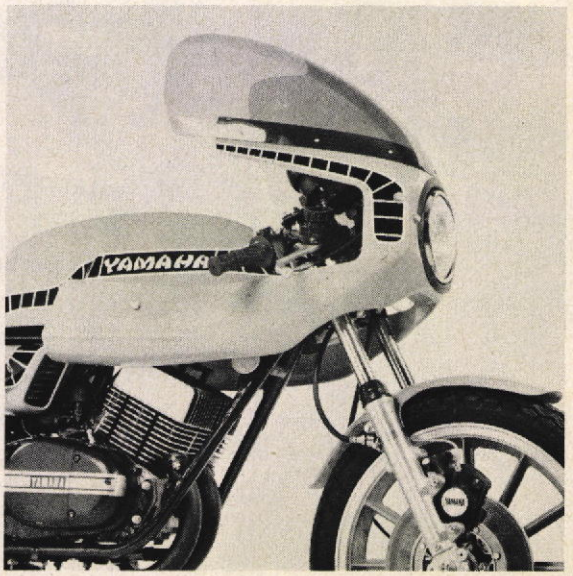
All of the mods pictured here were installed in less than a day without the use of any special tools. The Dick's Cycle West kit needs only a few holes drilled and a little bending of the stock tank brackets to install, while the Telesco shocks and Bassani pipes are bolt-on items. To ensure that the bike stayed up on two wheels, we opted for a set of Dunlop K81 tires.

With the extra tire grip and the rear-set footpegs considerably higher, it is almost a must to remove the center stand. Under normal conditions it stays out of harm's way but with a machine set up in this manner, a little extra effort is used in the corners and it can prove painful to lift the back end of the bike up when the stand makes solid contact. The side stand works fine and it is only a slight inconvenience not to have the center stand.

The mild but extremely well done paint scheme was handled by the renowned 'Tweety' and the bike is an eye catcher wherever it goes. Taking for granted the slightly uncomfortable riding position that is inherent with a cafe racer at slow speed, the bike is a joy to ride. It goes, handles, stops and looks great. In fact, that could be the dictionary definition of a cafe racer if Webster gets around to writing one. •



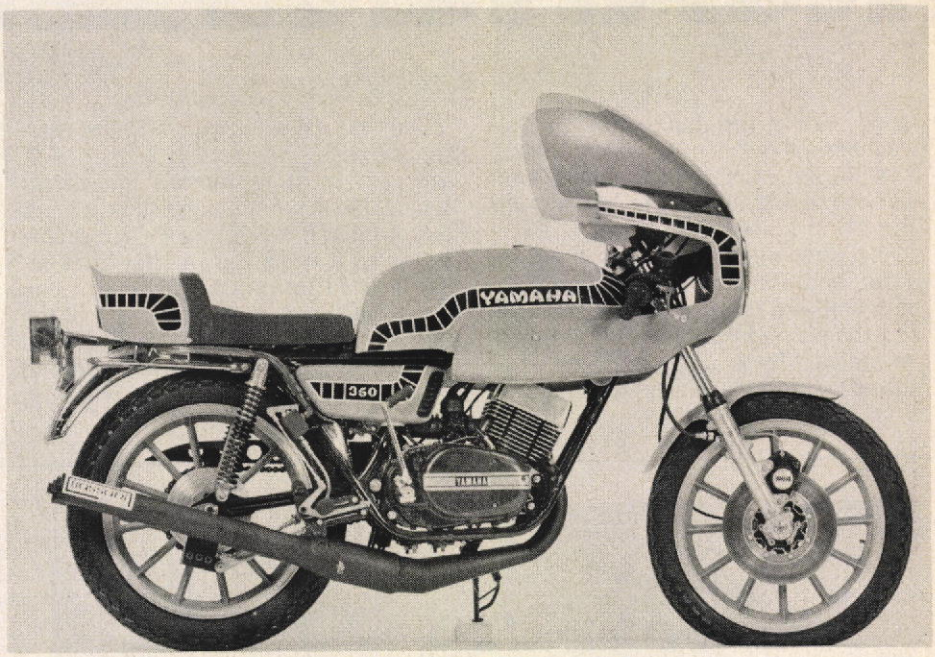


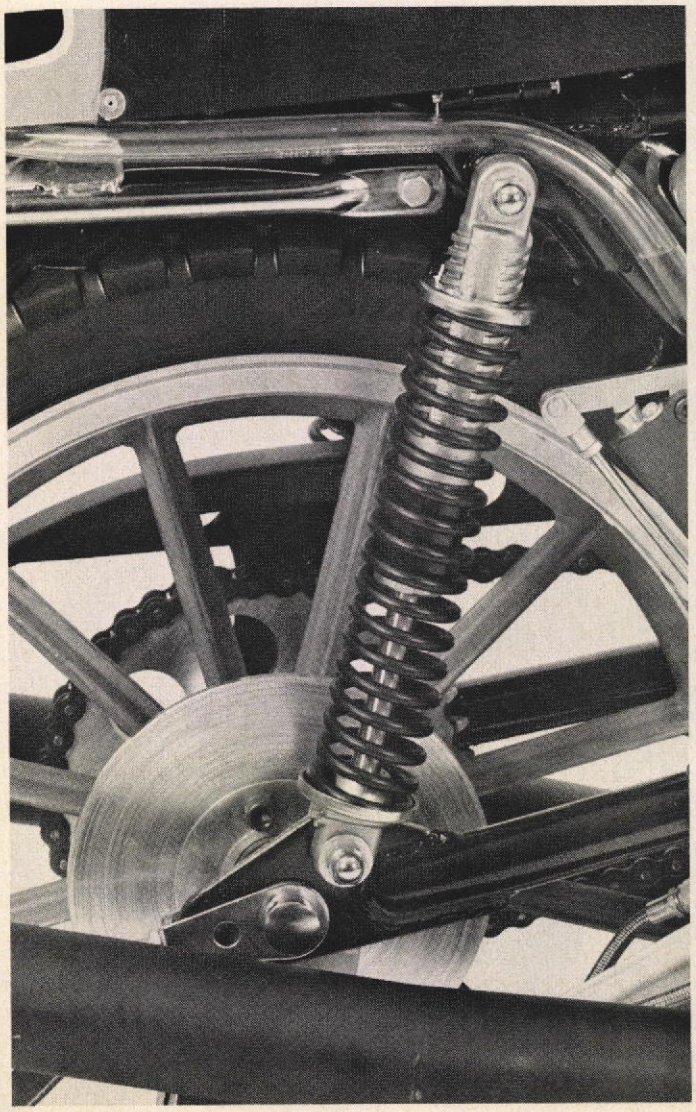


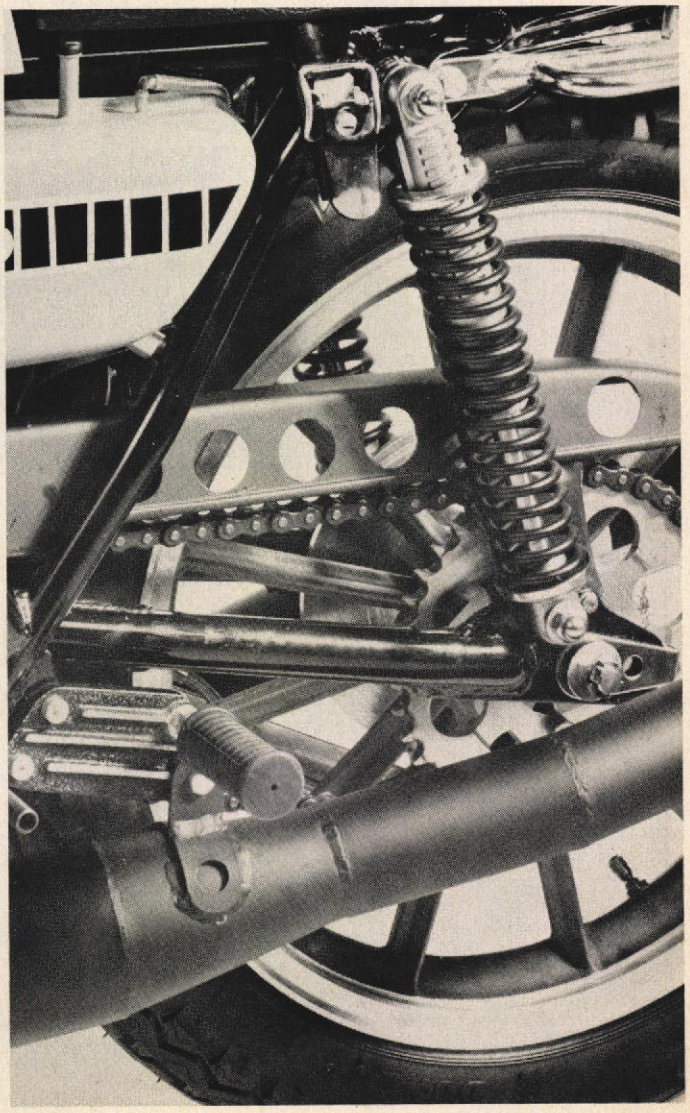
(Left) Handling of the RD350 is as good as anything around and with the cafe racer riding position, it feels even better. Fairing doesn't do much for top speed but it keeps you out of the breeze and does wonders for the looks. (Below left) When it came around to installing the rear wheel and disc, we found it was easier to use the Target pegs as they are made with this in mind. The DCW units were just as functional but it would have taken a little fabrication on our part. So we're lazy! Master cylinder is actuated by linkage rod with breather tube exiting up under the seat. Kick starter lever cleared with ease. (Below right) The fairing mounts with a minimum of hassle with all bracketry supplied. No welding is needed although the stock front tank mount had to be bent slightly to accomodate the front fairing mount. The side steadies are fastened with hose clamps and the the whole assembly can be adjusted to suit different handlebars or riding styles. Headlight attaches to fairing with two bolts. The bracket had to be bent to clear the master cylinder with the use of clip-ons.

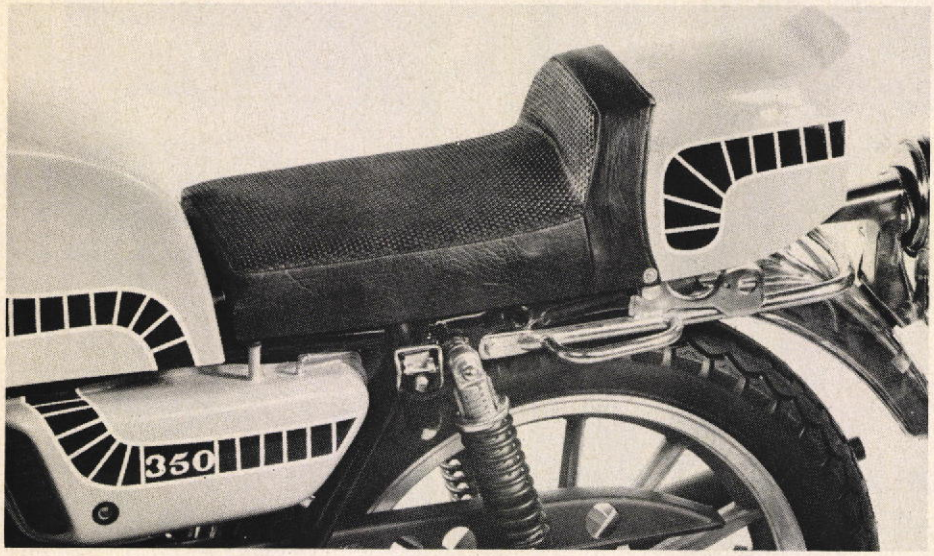
WELL DRESSED STREAKER

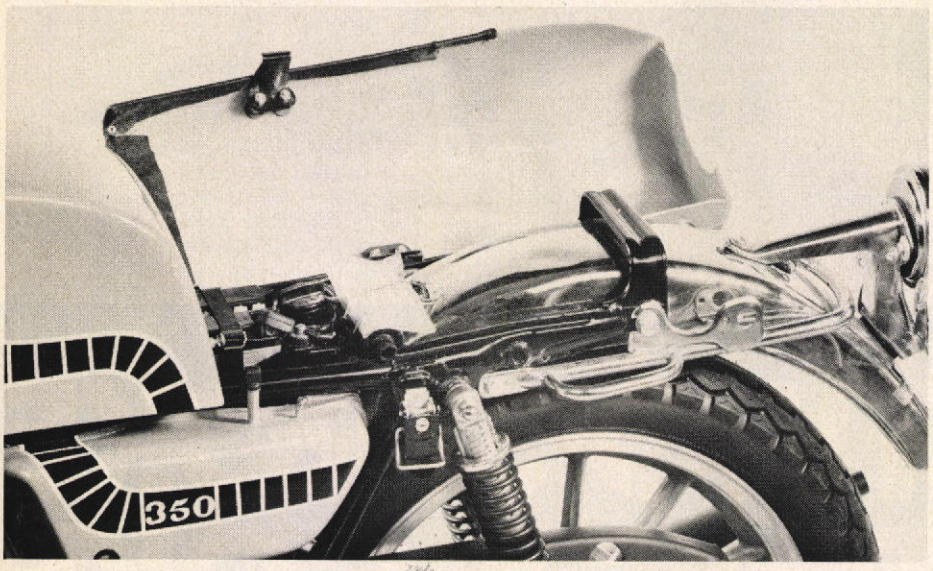
(Right) The tank/seat line is very reminiscent of the Yamaha TD-TR series road racers. The Bassani exhaust system is a bolt-on affair and although the pipes look low, they are well tucked in towards the center line of the machine. (Below left) The Arnaco rear units, mounted upside down as recommended by the distributor Target Products, worked well and kept the back end in line even over fast bumpy corners. Something that the stock ones fail to do after they get warm. Notice the 8" aluminum disc. Slightly sensitive but strong. (Below right) Stock chain guard was drilled and painted flat black to get rid of that glitter look. The stock sprocket bolts right on to trick wheel with adapters supplied with kit. Once the wheel bearings were installed, it was as easy as replacing the stock wheel. A TZ swing-arm was considered but as the stock one is fairly rigid, the time and expense wasn't worth it.



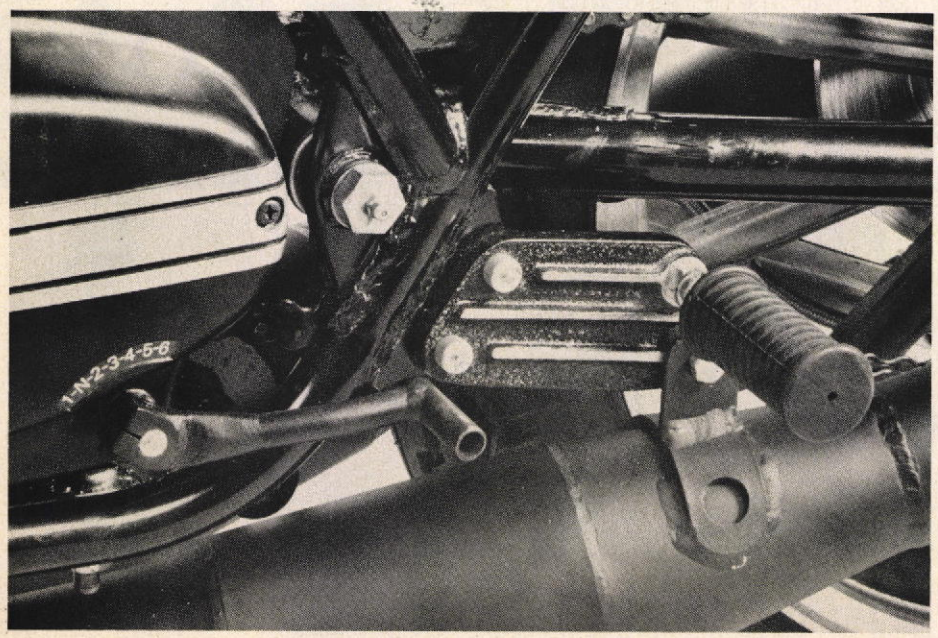






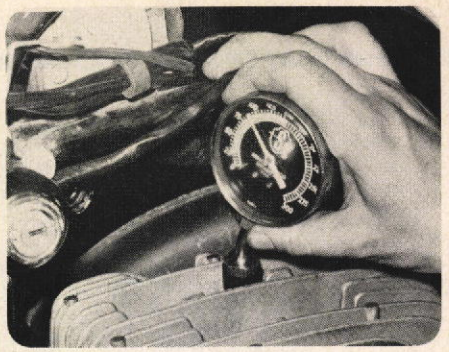


(Left) The seat uses all of the stock mounts and can be installed in a matter of minutes. Trick orange/black/white paint scheme was applied by 'Tweety'. Seat is comfortable and leaves room for moving around. Under acceleration, the racing countour holds you in place. One of the good things about using all of the stock mounting hardware is that the seat can still flip up easily with the spring loaded latch. Lock is still used. As the oil filler cap is located here, it is a worthwhile item. Many seats on the market mount rigidly, making it a major job to top up the oil. When the seat is latched into position, the forward portion of it acts as the tank retainer. Although the tank is bolted on at the front, two little fittings reach just under the seat, ensuring positive locating.

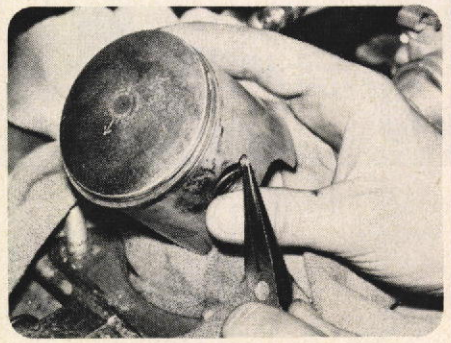


(Left) With the Target footpeg arrangement, the shift pattern is reversed with up for first and down for the rest of the gears. This eliminates a linkage that could get sloppy and brings the shift pattern in line with accepted racing practice. Gear changing was precise. The Bassani pipes mount to stock brackets or line up perfectly with the provided holes in the backing plate for the folding footpeg. A rubber grommet is provided so that the pipes are mounted in such a way that they cannot vibrate and fracture.

photography: Pat Brollier



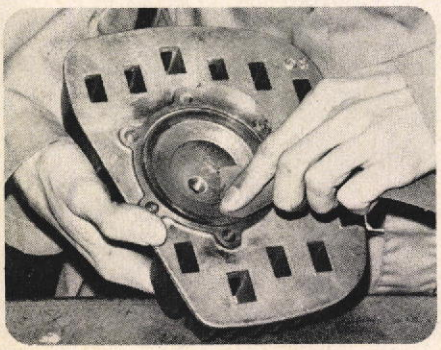
1. *Suspecting loss of power, start with a pressure check. Instrument costs about $5, is handy to have around. You're in trouble if pressure is under 120 p.s.i. Hold firmly while cranking engine over.*



5. *Needle-nose pliers are used to lift out circlip from one side of the piston, again being careful broken pieces don't fall into case. Purpose of circlip is to prevent piston pin shift, scoring wall.*

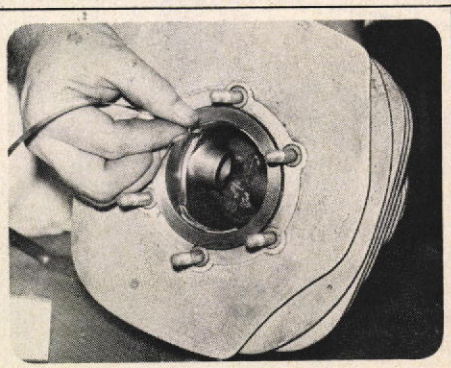
TWO-STROKE RING & COKE

9. *Determine amount of vertical play between ring side and piston groove. If it is more than .005, you are flirting with a new piston. Note chipped piston skirt. Look for scoring on piston and cylinder.*

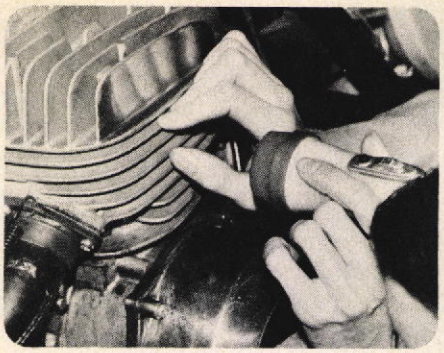


11. *For the final touch, shine it up with light emery paper. This is also a good time to scrub exterior of head and barrel to remove baked-on mud and oil. It does make a difference in way engine cools.*

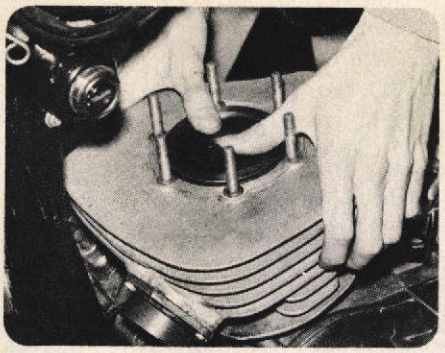
12. *Don't forget the ports. If a rotary wire brush isn't handy, a fine texture of emery cloth works equally well. Also check carb-to-manifold and gasket alignment, ensuring no misalignment exists.*



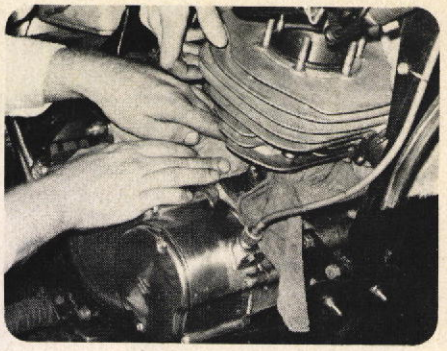
13. *Next two photos show cylinder taper check. Since piston has cam-grind (wider front and rear) and taper (wide bottom), we invert it in bore, with pin boss in normal transverse position. This gives . . .*



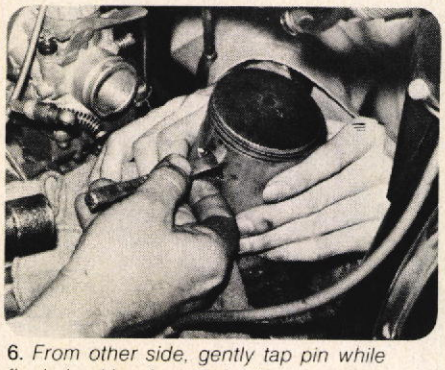
2. *Then you might check for gasket leak by eyeballing between fins with a flashlight. Escaping gases will show evidence of same between head and barrel. Pre-inspection helps determine inner ailments.*



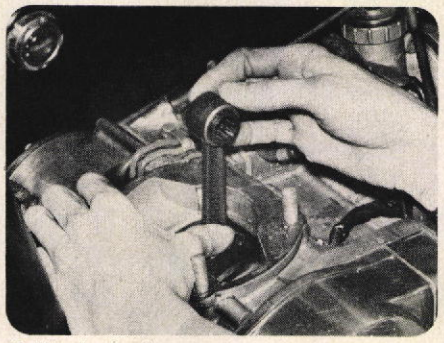
3. *Head off, check piston play with fingers by pushing fore and aft. If you can hear it rattle, there's good chance you may need a cylinder rebore. With exterior parts free, barrel is next to come.*



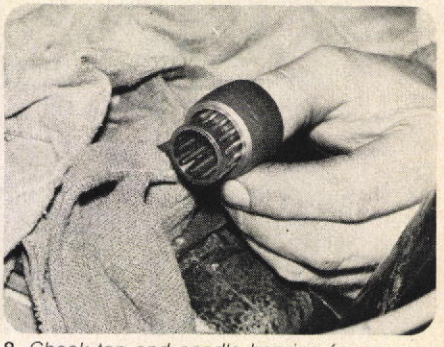
4. *All nuts away, bump or pry cylinder very tenderly up to avoid cracking fin. As it comes up, immediately stuff rags under it to preclude broken rings from falling off piston into the crankcase.*



6. *From other side, gently tap pin while firmly bucking far side by hand to prevent bending rod. Have you been noticing that the small arrow on top of piston is always facing toward front of the bike?*

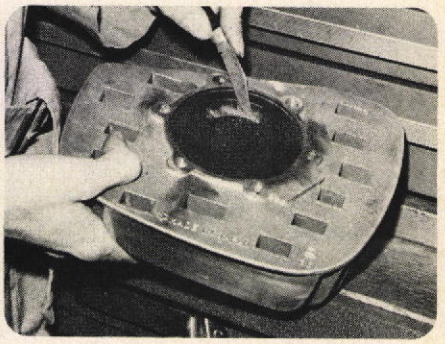


7. *Now's the time to check for rod lower end play on the crankshaft. Side play is of minor consequence but there should be no perceptible up and down play in connecting rod. If so, that's another story.*

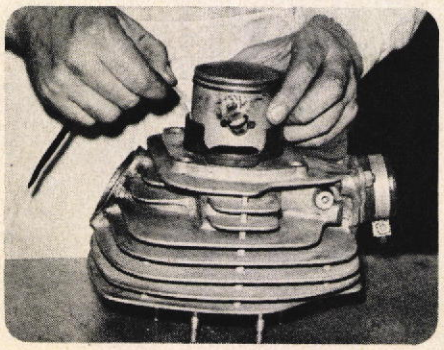


8. *Check top end needle bearing for any sign of flaking, grooving or failure of case hardening on rollers. Also, while free, they should be of tight enough fit within race so that they don't fall out.*

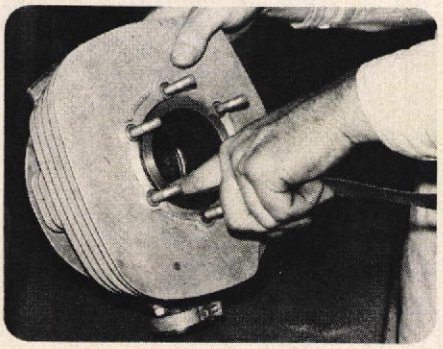
You can do it quicker and better yourself, and save a mint in the process, following L.A. Trade Tech students Mel Hale and Ken Dickenson through these 34 easy steps to peak engine performance . . . by Bob Greene



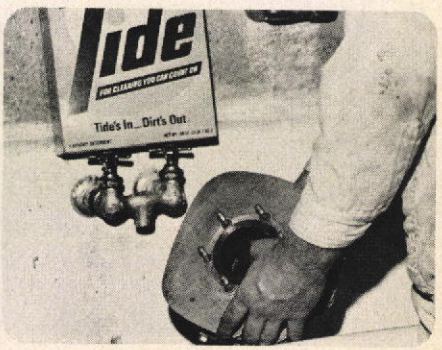
10. *An average pocket knife has just the right contour for scraping carbon off of head. Or rich dudes may whip out rotary grinder they got last Christmas. Take it easy around outer lip where gasket seals.*



14 . . . *measurement at tightest relationship. Measure piston/cylinder gap at top of barrel, then bottom, 90° to pin boss. Difference in tolerance tells the taper. If it's .003 or more, it's rebore time.*



15. *No sense being pessimistic; let's assume the bore was within tolerance and all we need do is rough-up the bore with #150 emery cloth, using Figure-8 motion to take glaze off bore, help seat rings.*

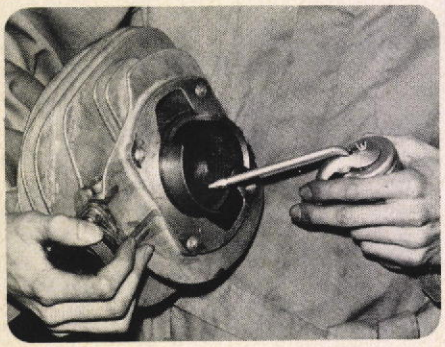


16. *Now a word from our sponsor: cleaning emery and metal dust from bore with gasoline isn't good enough; lengthy sudsing with Tide detergent and hot water is the best. Oil immediately or it will rust.*

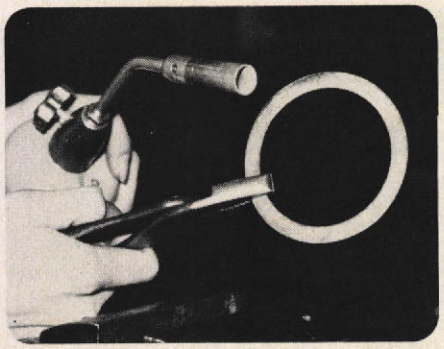
17. *With everything washed up hospital clean, slip a new piston ring into the bore of the barrel from the bottom. The mouth of the barrel is beveled to help keep you from breaking the ring. We're going to measure the end gap of the ring to make sure that its ends do not bind when the engine is running; if they did, trouble would be sure to follow and all of our efforts would likely be in vain.*

18. *To ensure that the ring is square in the bottom of the bore, where bore wear is least and ring closure the tightest, we push it down an inch or so into barrel with the piston head as shown here.*

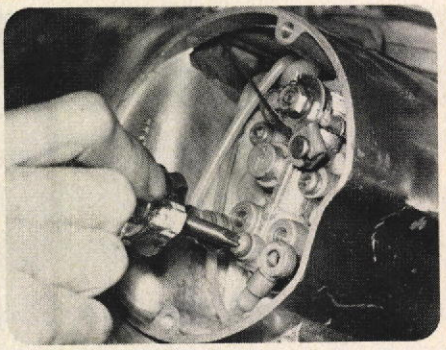
22. *Make sure you install the ring with its major relief at the top so that it will properly contour itself around the alignment pin as shown, otherwise it may bind and break when barrel's installed.*



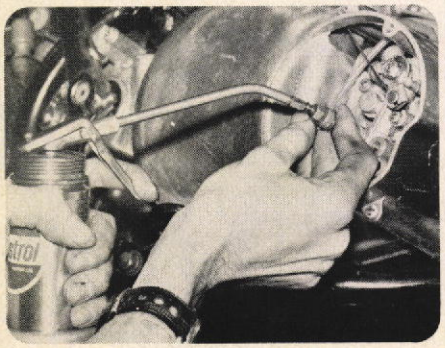
26. *Oil everything generously before it is put back together. We're also going to emphasize this in a minute regarding oil pressure head in the line, from pump to cylinder. Make sure you follow thru.*



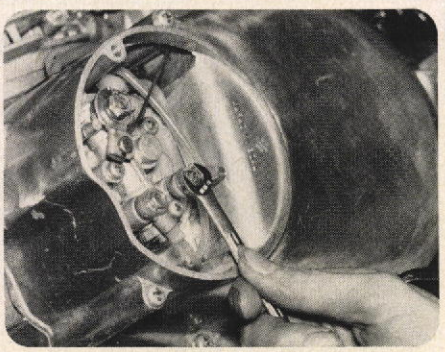
27. *With barrel in place, heat up copper head gasket to bluish tint, then quench in water to renew. After it has cooled, put on head, button up engine according to torque specs in alternating sequence.*



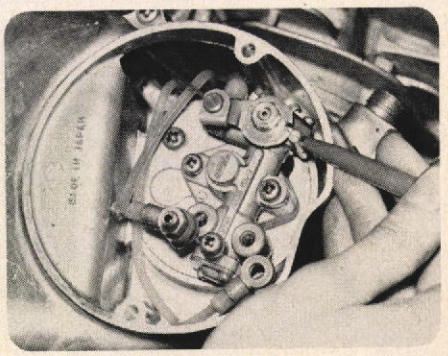
28. *Suzuki oil pump feeds two lines, to crank and intake port. Remove Phillips screw from pump body to ensure oil head, then bleed air bubbles out to guarantee uninterrupted pressure. Replace screw.*



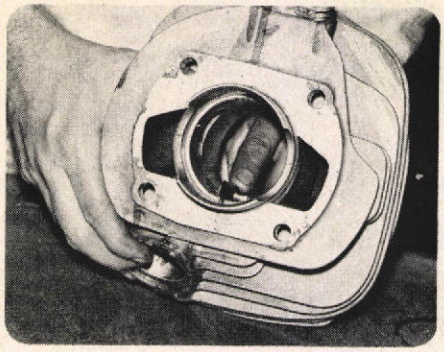
30. *With nut tightened, use pressure oil can to pump oil into both lines and up to the engine proper so that there will be no pause in oil delivery from the instant engine fires. Otherwise disaster.*



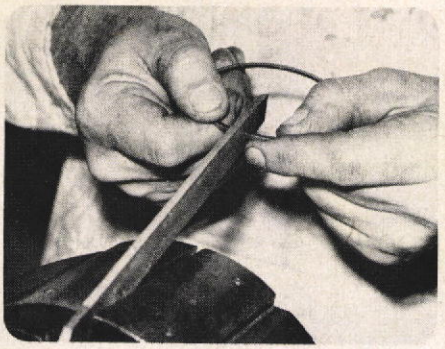
31. *When you are satisfied the lines are full, replace their respective banjos to the proper outlets and tighten them securely. Now we're going to make one more check before firing engine: pump control.*



32. *With engine off and throttle held at wide-open position, two stamped aligning marks indicated should exactly meet. If they don't, adjust back up at cable adjuster just outside of the engine case.*



19. *With the ring straight in the bore, near the bottom, reach in with a feeler gage and check the gap. Gap varies with manufacturer's recommendation; otherwise gap it at around .012 and you'll be ok.*

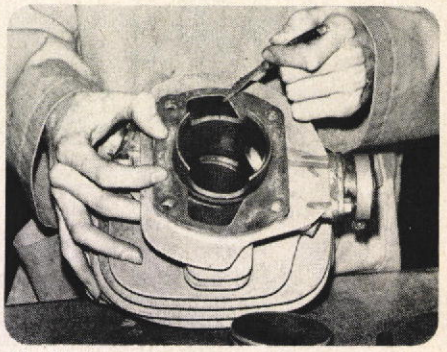


20. *If the gap is too small, lock a file in the vise and give it this shot. Go a little easy for it shouldn't take over a couple of thou. Fitted too close, they are more apt to seize when temp comes up.*

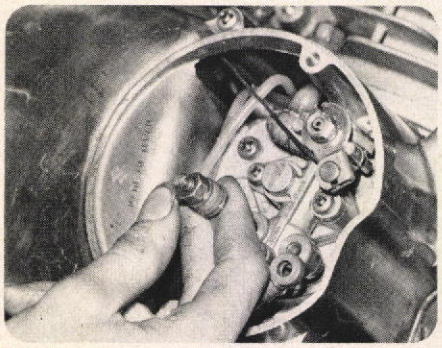
21. *Rings can be installed by hand without breaking, but cheap ring expander is better at it. Be sure ring locating pin in piston hasn't fallen out, for if ring rotates, it can catch in port and break.*

23. *If piston isn't pinned, look for a small initial "R" on the ring, which indicates top. Oil piston pin and install it on rod. Don't forget the circlip to hold piston in place on the rod.*

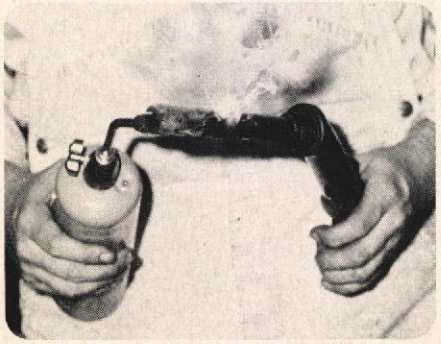
24. *Here's a closer look, and the final reminder to fit the piston with arrow in forward-facing direction. Most pistons have offset pin to reduce slap noise and thus the concern about directional fit.*



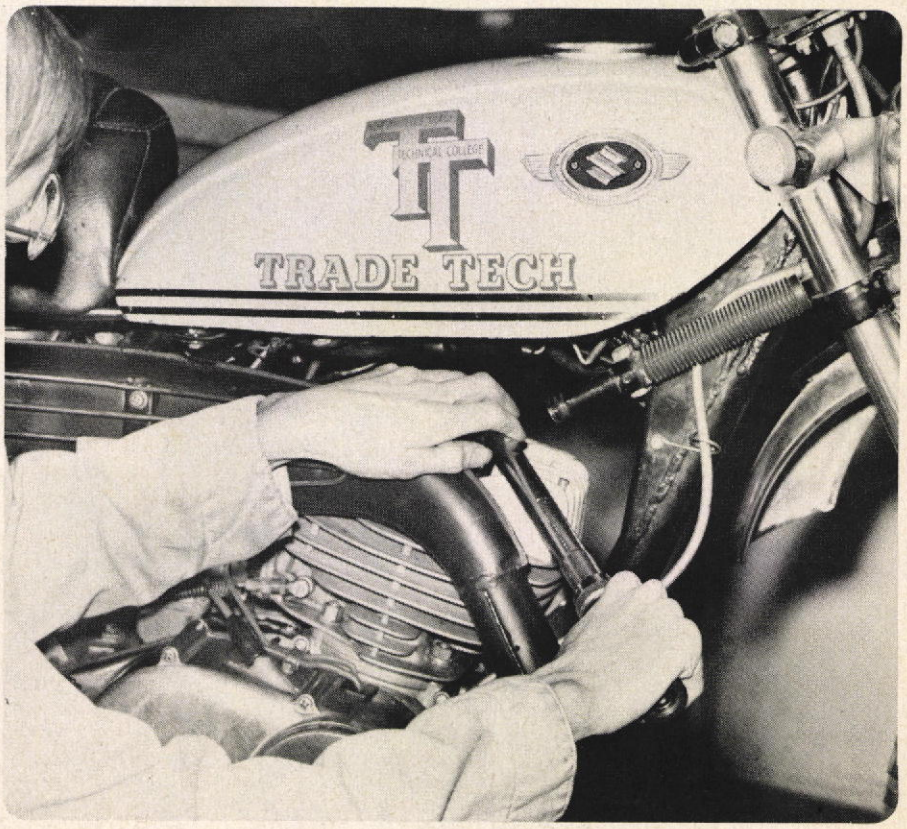
25. *Would you believe that there are 8 different ways this cotton-pickin' base gasket can go on and look deceptively right? Be careful. Also trim any overlap that may exist around transfer ports.*



29. *Now disconnect both banjo fittings from pump outlets, reverse banjo bolt in banjo and fit an appropriate 6mm nut to make it oil-tight because we're going to force oil into the line, up to engine.*



33. *With the engine all buttoned up, it would be a good idea to burn excess oil and carbon off the inside of the muffler tube with a small hand torch. Most two-stroke mufflers are made to come apart.*



34. *After the bike has been thoroughly road tested and the engine brought up to operating temperature and allowed to cool, take a final lap around cylinder base and head nuts with torque wrench. Then tip your hat to ol' L.A. Trade Tech School of Motorcycle Mechanics. No wonder they're good, their "Professor" is Pat Owens, former racing division ace tuner for the Triumph Corporation. You lucky dudes!*

MOST ADULTS I know don't like mud. Or think they don't. Maybe it's because, when they were kids, their parents always said, "Stay out of the mud!"

And if you came home muddy, it was a crime against the universe. That's how it was with me. Just like the next guy, I learned that mud is bad, and nice people stay clean unless they're grubbing around the garden or something.

Then I bought a motorcycle. A Kawasaki enduro. What I had in mind was to have a little fun riding around the boondocks. And for the first couple of week-ends I stayed on the hard and narrow path. The bike was peppy, easy to handle, and I felt good riding it.

But my third time out, it had rained the night before. And there it was confronting me. Lots and lots of mud.

At first I kind of crept through it and got a little splattered, and then I thought, "What the hell," and opened up the throttle and, man, did I go. I roared through every mudhole I could find. And before long I was a flying mudball, Mr. Muddy. But instead of feeling dirty, I felt absolutely clean. My bike must have felt clean too, because it zipped along without one sputtering complaint.

Washing off the mud at home was like washing off the best time I had had in years. I hope next Friday it rains again. Really hard.

Kawasaki
lets the good times roll.

Good times include riding safely. We recommend wearing a helmet and eye protection, keeping lights on and checking local laws before you ride. See Yellow Pages for nearest Kawasaki dealer. Member Motorcycle Industry Council.

THE YEAR OF THE
MT 250

Horsepower is a magic word. It means strength, muscle, *macho*, and all that other he-man baloney. Within this tiny sphere of motorcycling too many people predicate their choice by reading a dyno chart. Too few look at chassis, suspension, dealer network, parts and service availability, and the total costs of all this. True, power gets you from one corner to the next. So the more you've got the quicker you go. The real question is in the fashion of getting to that corner, a screaming out of control wheelie, or in-control, tire-smokin' acceleration; and how many of these journeys you're gonna' make between overhauls. (Don't know of any 250 enduros that'll smoke a tire or wheelie for a whole city block.)

Honda, along with Harley-Davidson and a few others, doesn't care to publish horsepower figures. They obviously don't get as much as some of their competitors, and generally the customer only figures the higher the number the better the bike has to be. The other things mentioned about service and parts don't fit into the *macho* theme.

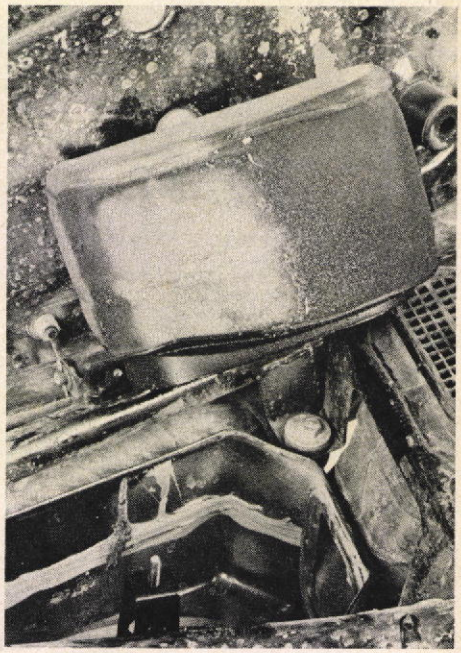
Power delivery, how it gets to the ground and the way it responds to the turning of your right hand while picking your way across slippery rocks or carefully motoring an icy road, is far more important than getting a flash dyno reading from an engine turning max rpm. It should chug as well as spin and not come in somewhere along mid-range as if getting swatted in the rear with a forty-pound wooden plank.

In the case of the MT250, Honda has proven their cause. The quarter-liter two-stroke goes about its job efficiently and with very little fuss. Primarily a street machine with off-road leanings, the MT's major shortcomings become obvious when the bike is taken from a friendly tarmac surface into the off-road world of bumps and hills. There you'll find the rear shocks don't dampen and the gearing is too tall.

For everyday commuting it's not a bad choice. A 2.2 gallon fuel tank can allow up to a 90-mile ride before coughing to a fuel-starved death. It moves out with the flow of traffic, and if you're quick on the trigger the MT will get across an intersection before some English teacher has put her Impala into "drive."

Our legal maximum speed limit is within comfortable cruising speeds of the 2-stroke Honda which indicates 5500 rpm at 55 mph. Admittedly, we never saw the red line of 7000 in fifth gear, but overdid it a few times in the first three. Vibration while cruising is nothing more than a tingle on the footrests at around 50 mph, with it soon disappearing as the speed climbs. Performance is not the MT's long suit; comfort and reliability are.

Besting other Japanese enduros in our great 8-way comparison (January '75), the MT for this year was only slightly improved over the '74 model. In a few brief words, it lost its rubber-covered footrests and got a little more horsepower. The brush-chrome exhaust heat shield is now plain old black and the plastic cover on the other side has changed colors.



(Far Left) With the change in gearing and suspension, the bike took on a new personality. (Center) Looking completely at home in a high speed drift. Honda's MT could very well be the shock of the year. (Above) Unfortunate design of air filter assembly sandwiches nearly half of filter's surface area against container. A smaller screen and foam element would actually offer more surface area.

For $50 More, It Can Be A Winner

by Dave Ekins

Photography by Mike Parris

We didn't particularly like the shocks or the too-small gas tank filler hole when we first saw the bike two years ago. Doesn't matter, the MT's got the same gas cap and shocks.

It has more horsepower now. Honda told us that an improvement in the carburetor to make it flow more fuel is the only change. But close scrutiny seems to indicate an exhaust system with greater volume. There could have been some internal whittling of the ports, but even if we tore the thing apart we'd need an early cylinder with which to compare. The power from the MT is not astonishing, only adequate, so there wasn't a whole lot to inspire us into dismantling the thing.

We would nod in agreement if Honda fitted those wonderful hardened alloy rims found on the slug XL and those fast Elsinore racers. They didn't. We had a few encounters with rocks while testing the MT, 2-ply trials tires and all. With 10 psi in the tires, the rims bent but there were no flats. It's possible the hardened alloy job wouldn't bend; the tire wall might break instead, a difficult trade-off that would be solved simply by using 6-ply tires and those super alloy rims.

Fitted with two security lugs on the rear and one up front, it's easy to run low inflation pressures without fear of slipping a tire. Only problem we noticed was that the two spokes under each security lug would loosen for no reason. We caught it only once on the front but several times on the rear wheel.

From the above description you might say we were running the bike a bit fast across rocks; we were. The MT puts confidence in your riding; it's one of those bikes where you use all the throttle and are going faster than you should but don't realize it until it's time

HONDA 250 MT

TEST BIKE	HONDA MT250
Engine serial	MT250E-2000002
Base price as tested	$1130.00
Factory warranty	6 mo. 4,000 mi.

ENGINE

Type	Single cylinder, piston port 2-stroke
Displacement	247.8cc
Bore x stroke	70.0x64.4mm
Claimed HP @ RPM	N.A.
Claimed torque @ RPM	N.A.
Compression ratio	6.6:1 (corrected)
Lubrication system	Oil injection
Carburetion	28mm Keihn
Air filter	Oil wetted foam
Ignition system	magneto, points, coil
Electrical system	alternator, rectifier & 6v battery
Starting	Right foot, direct
Exhaust	Muffler—spark arrester

DRIVE TRAIN

Primary/ratio	Gear—3.30:1
Clutch	wet, multi-disc
Transmission/shift	left side
Gear ratios	(internal) 1st 2.235; 2nd 1.571; 3rd 1.160; 4th 0.896; 5th 0.718
Final drive/ratio (sprocket teeth)	2.933 (15/44)

CHASSIS AND SUSPENSION

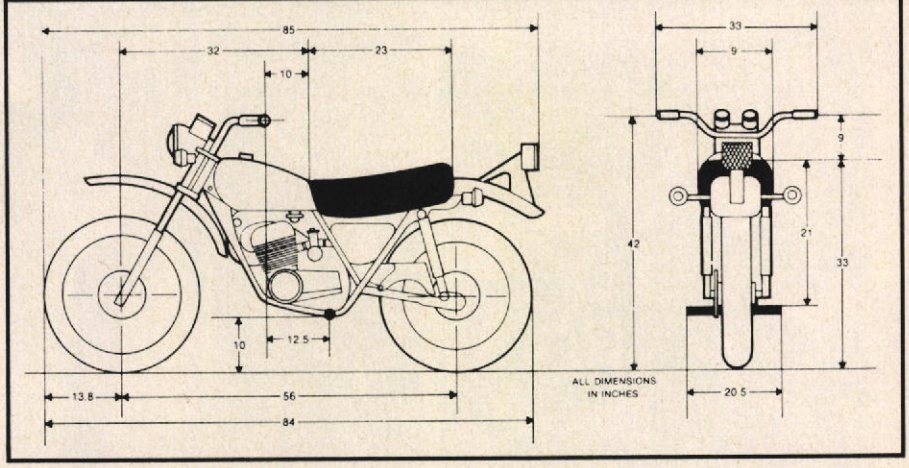
Frame	tubular, single loop, double cradle
Suspension, front	double damped telescopic
rear	double damped—5 position adjustable spring
Turn radius	N.A.
Brakes, front	SLS 6-inch drum
rear	SLS 5.5 inch drum
Tires, front	3.00x21 trials
rear	4.00x18 trials
Rim locks, front/rear	one/two

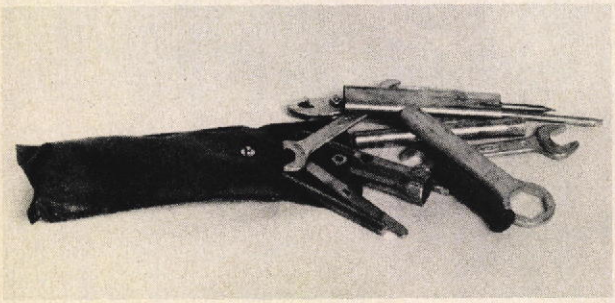
WEIGHTS AND CAPACITIES

Weight, wet, unladen	277
Allowable gross weight	N.A.
Fuel capacity	2.2 gals
Engine oil	1.4 qts.

STANDARD EQUIPMENT

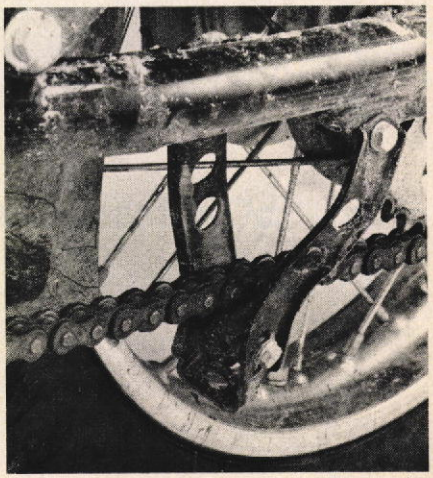
Speedometer	10th resettable
Tools	12 pcs.
Stands	Left side
Passenger provisions	None





Fifteen piece toolkit has enough in it to do most driveway adjustments. Tire tools would be a welcome addition for most of us. Kit hides in two-piece plastic container between seat and filter.

Proper working fork seals weep a smear of oil and wipe the stanchions clean. Dirt builds up at end of fork's travel (notice slight bit of oil run-off from wiper on back side of alloy slider).



Chain guide tangled with a large rock, came out second best. We bent it back this much; thin steel piece could be made a tad shorter and possibly stronger.

to slow down. A 56-inch wheelbase and a bunch of trail built into the MT's steering geometry make it a slow-handling bike despite a lousy pair of rear shocks. Forks aren't too much better as they topped a lot. The smooth engine and tall gearing combine to lull your senses and you just don't realize you're really cuttin' a fast trail, except when the back end starts jumping around.

You sacrifice the ability to turn quickly with this geometry while negating tank slappers. All bikes like to do a snake dance on sandy roads; the long MT does it less than the others.

The bike sits comfortably has a well-contoured and well-padded seat unless you miss and catch its edge. Standing is just as natural without a bunch of things interfering with your legs. The exhaust shield is tucked-in, smooth and cool. All the controls are right there, even after we dropped it a few times. The brake lever succumbed to a rock for a bit of reforming but still worked.

During our mountain testing, which is primarily riding trails from 4,000 to 8,000 feet, we found first gear to be a tad too tall, and we never did use fifth. Carburetion was barely affected by the altitude change, and this is especially interesting since we ran it at sea level a bunch of miles later. Brakes are great in the waterproof department and offer good feel for both types of riding.

You don't notice an inlet roar, and the exhaust note is really quiet. The pipe contains a spark arrester with a bent plate on the end to direct exhaust away from the back of the motorcycle.

A very clever air filter design has its inlet under the seat just in front of the rear fender. A large plastic mesh separates stones from pebbles while farther down, a fine open-pore polyurethane foam aided by oil traps the dust. This unit is particularly well shielded from water; you would probably have to submerge it to get the element wet.

Our particular bike left a little puddle of transmission oil when parked. We found the shifting rod seal to be at fault and should have warranteed the defect. Instead we kept busy looking at the plastic dip stick to take daily note of the amount seeping away. However, the loss never did require us to open an oil can and bring it up.

MTs come with an NGK8 fitted. This is a warmish plug, but its color always seemed to be toasty-brown. After about 300 miles of riding the plug refused to fire under heavy loads, 6,000 rpm in fifth gear. We replaced it with a Champion N3 Gold Palladium (the only plug available 300 miles into the bowels of Mexico) and power was restored.

When you sit on a bike for nearly seven hours, covering 160 off-road miles, you can learn a lot. On one leg of a nice twisty dirt road the MT got 46 miles to a gallon of Mexican gas. And, on a 52-mile section climbing into the mountains, riding hard dirt and sandy roads, it used a whole tank. That's about 25 mpg.

Lubed daily, the chain never had to be adjusted in 500 miles of riding and a quart and a half went into the oil tank. If you disregard the things that can be easily corrected (shocks, tires, etc.), the big critique of the MT would be its gearbox.

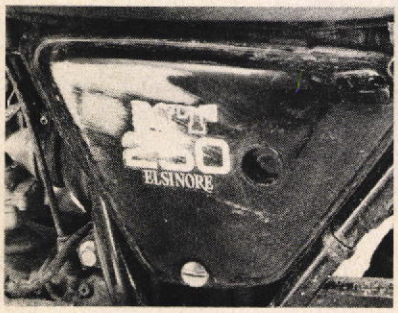
Widely spaced and adequate for highway use, we found the 250 just didn't have enough grunt to make the step between gears under certain conditions. A 360 or larger displacement would be ideal. But in dealing with the 250 they should slip a sixth speed in there someplace without changing the differences between bottom gear and top. That added gear-set could close up the steps and make it a better 250 for off-road thrashin'.

One of the benefits of our big comparison tests is a scoring system that allows us to relate back to other bikes. Last month the MT was beaten by three very good machines while it did better than four others, the Harley, Kawasaki, Yamaha, and Honda XL. The MT's score was 5.405. We criticized the bike for having too tall a gear ratio and terrible rear shocks.

So we installed a 14-tooth countershaft sprocket up front and a brand new set of Honda's CR rear shocks. The pieces bolt on, just move the wheel back to take up slack in the chain gained because of the smaller sprocket. Now the bike works off-road.

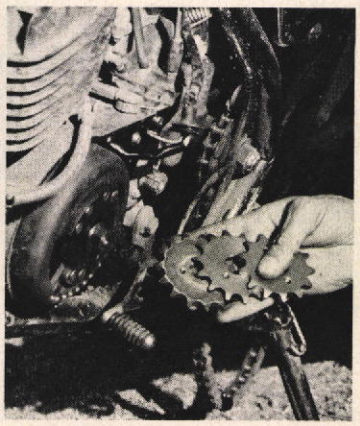
The new set-up gained us .4-second in the 10th-mile. It got over the hill-climb in second gear—instead of first—shaving .7-seconds, and whistled around the two-mile course .3-seconds faster. The real impressive gain was over on the special test where shocks and gearing are put to the acid test. 5.2 seconds quicker than the stocker and the shocks never bottomed all the way around! And you know what? If we had this gearing and shocks on the MT last month it would have nosed out the Husky WR by two percentage points.

Honda's MT250 fits most anyone of medium to large build and is ideal for novice or experienced rider. There are plenty of aftermarket shocks to correct that weakness, but we feel Honda's own CR units to be the wisest choice.---A prod of the starter, a flick of the shift lever and away you go on the smoothest, most confidence-inspiring ride ever. •

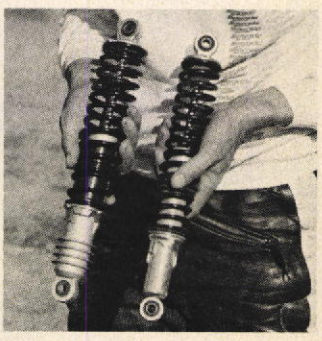


Last year this plastic cover was silver; for '75 it's grey with thin coat of black paint. After a few hundred miles in the out-back country rider's boot wore decal and paint away.

We applaud Honda for cleated footrests, brake pedal, and like the kick starter for tucking away. Boot wore the paint off primary cover, and brake pedal became smashed in the rocks. Larger skid plate just might save pedal, and magnesium side covers.



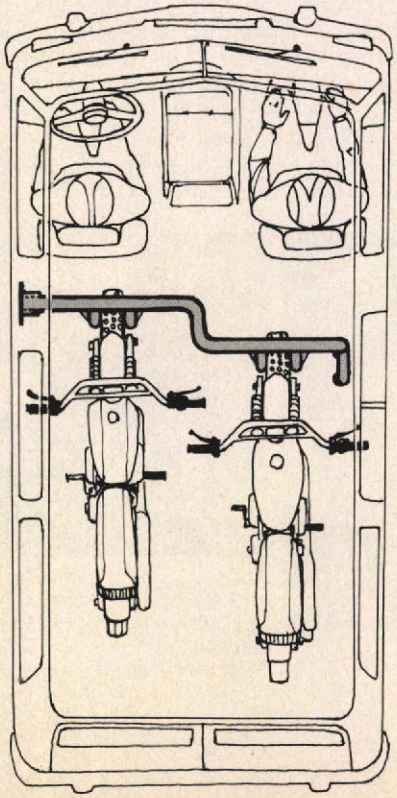
You can have a choice of three sprockets, 15T (standard), 14T, and 13T. We found the middle one worked best for most off-road applications. Changing them is simple if you don't mess up screw heads.

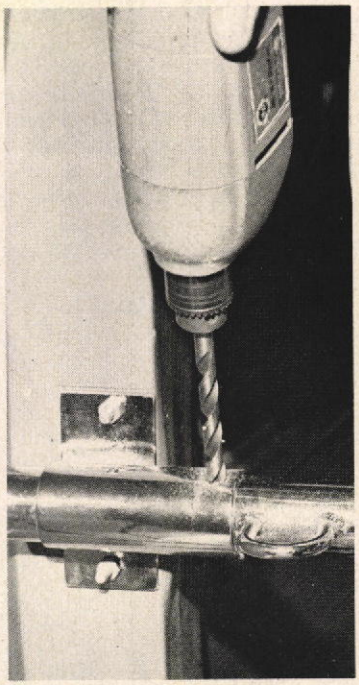


The CR shock is the expensive looking dude on the left. Racing unit weighs a few ounces less and has superior hydraulic action. Fins are supposed to help cool internal fluids.

Just for biker's... VAN/PICKUP TIPS

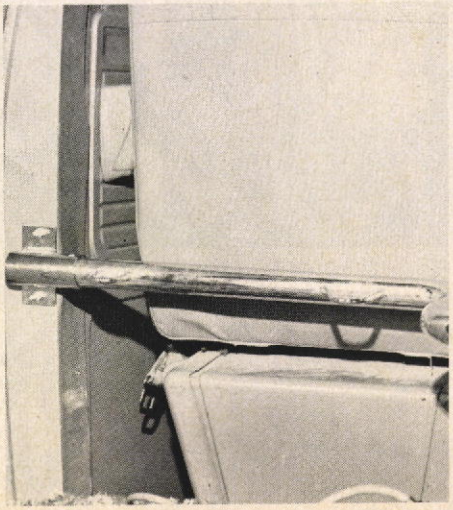
Securing a couple of machines in the back of a van can be extremely simple as evidenced by this easily removable rack offered by Select Vans, 17955 Sky Park Circle in Irvine, Calif. While they can be purchased in black for $45 or chrome for $70, the handy do-it-yourselfer might be able to build his own. It's a great idea and can be applied to any vehicle.





Built of large diameter tubing, the rack itself slips into slightly larger tubing brackets bolted in van. Hole drilled through both tubes will take removable locking pin.

The door side mounts are bolted to the van floor. When the rack is removed they are all that remains.



Cross bar against which the bike's front wheels sit is "S"-shaped so that one bike is farther forward. This prevents handlebars from coming in contact with each other.

Demand Action

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Laverda builds exceptional motorcycles.

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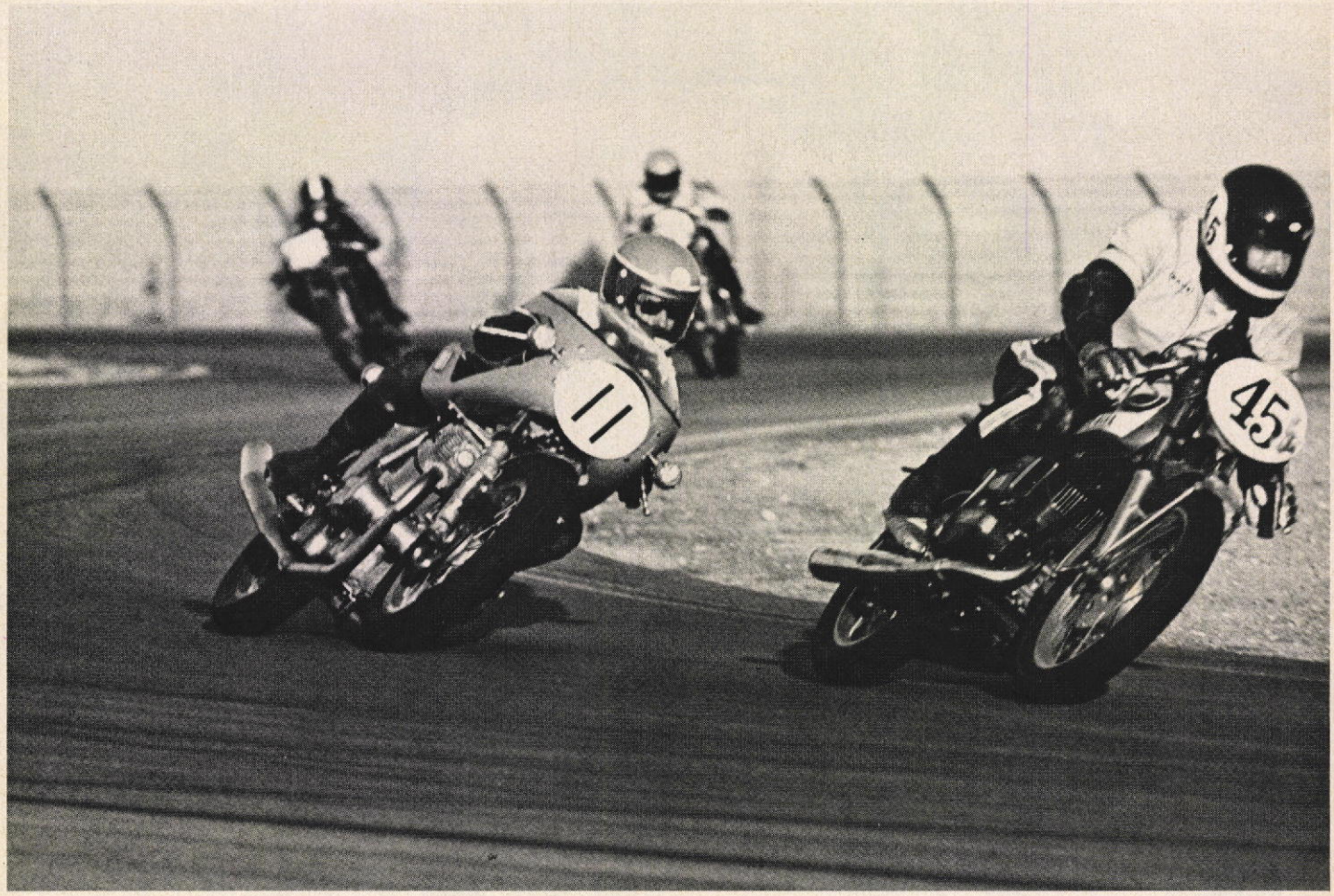
Built for 24-hour racing, the . . .

LAVERDA 750 SFC

by John Weed

. . . but sometimes you don't have all day.



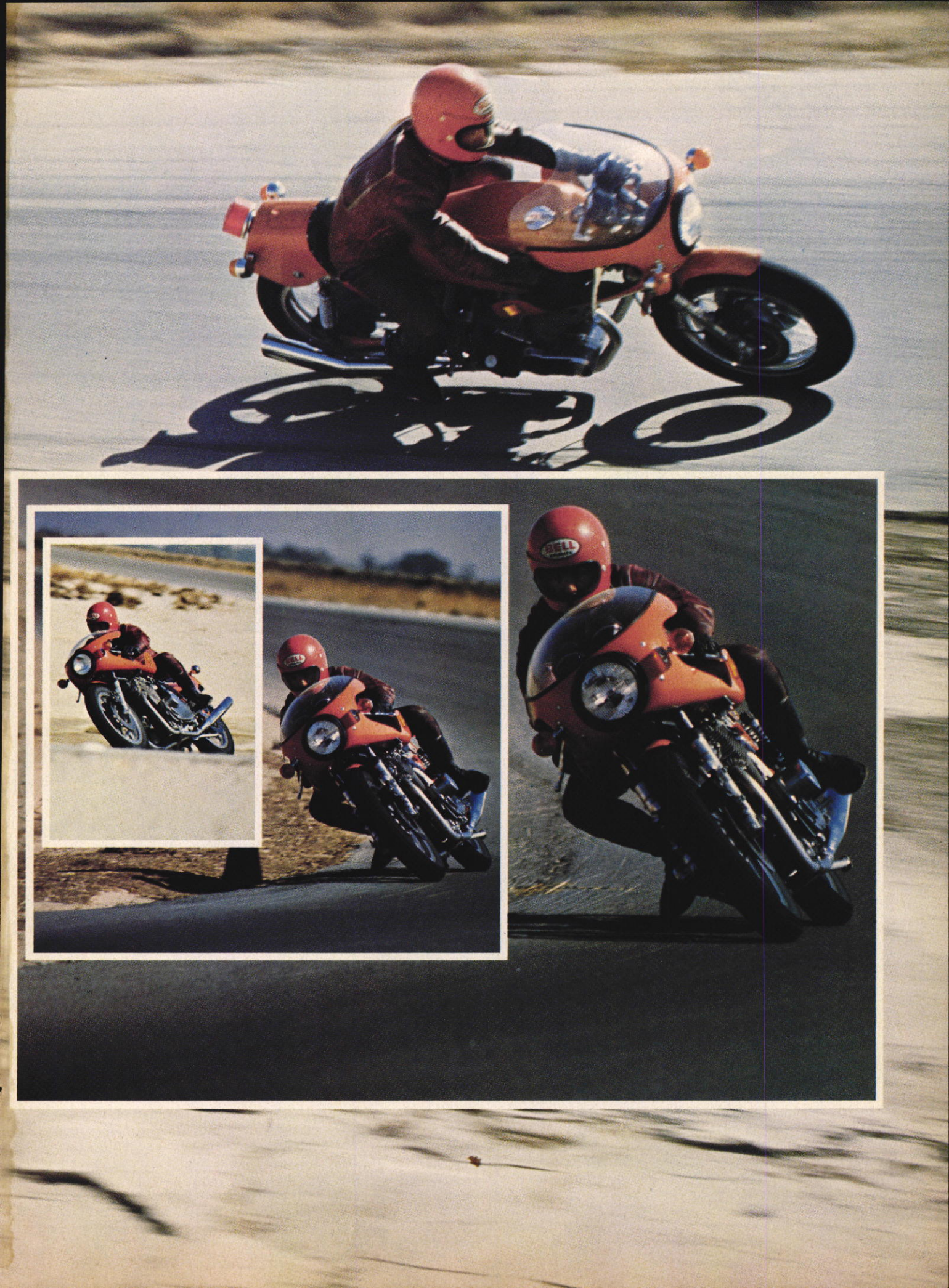
Motorcycles are becoming more specialized every day. Only a few years ago it was possible to take one basic showroom model and make it into any type of competition winner with the removal of lights and a change of tires and handlebars. Those days are gone, probably for ever.

Now it not only takes a special kind of motorcycle to win races, it takes a particular model of dozens offered by a manufacturer to get the job done. If a manufacturer wants to be competitive, he has to have a motorcycle that is cut out for one particular kind of racing and turn all of his attentions to perfecting it for this task.

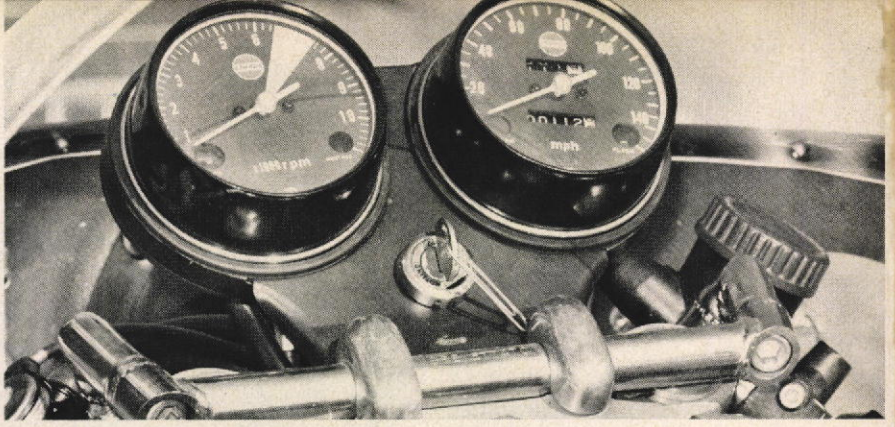
While this is relatively new to the major manufacturers, most of the European firms have been operating along these lines for years, especially the Italians, which brings us to the subject of this test—the Laverda 750 SFC. On first inspection, it is clear that the bike is intended for production road racing but it goes even further than that. It is intended for *long distance* racing; specialization within specialization.

Most people approach a motorcycle with some preconceived ideas. Of course these ideas shouldn't affect your judgement of a particular machine but most people either like or dislike a motorcycle from reputation, appearance or a combination of both. Italian motorcycles are different. Everyone

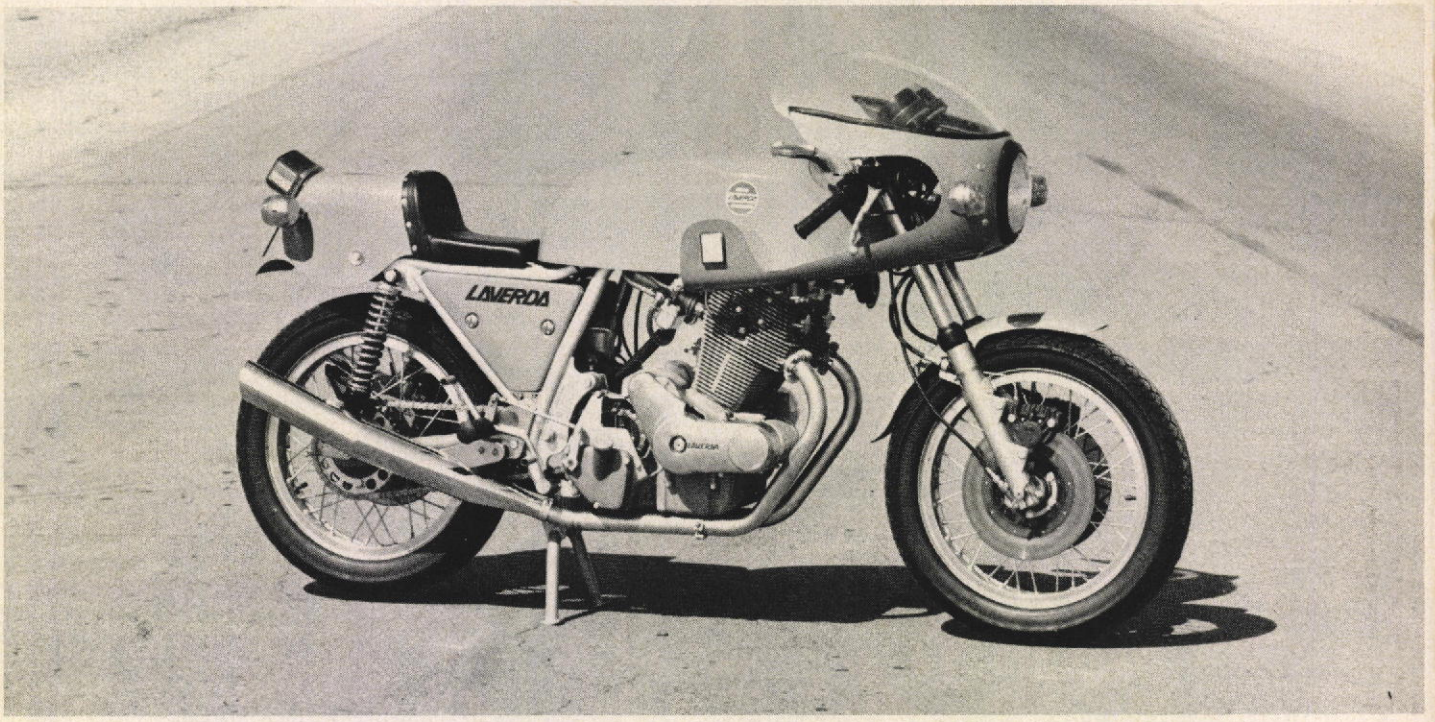
While the Laverda 750 may be giving away a little in the horsepower department, it can be heeled into corners as hard as your right wrist will allow. Part of the performance lag is a relatively high weight of 500 pounds, coupled to an engine that was designed to run at maximum revs for a day or two.


BELL

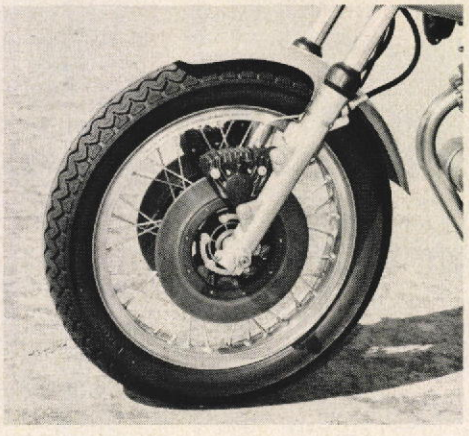
LAVERDA 750 SFC

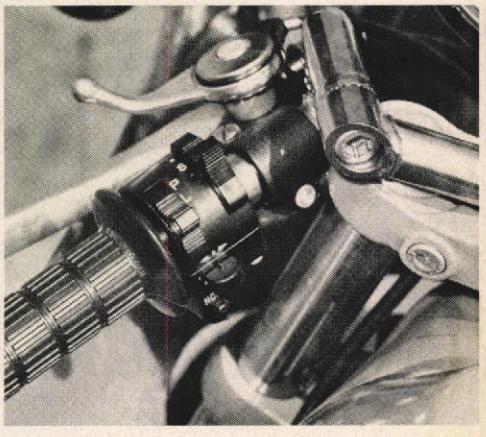


(Right) Instrumentation is Japanese ND, the same as fitted to most Hondas. Typically, the tach worked fine but the speedo bounced around at will once three digit figures were reached. Center mount-key was neat and so were the adjustable bars. However, they are not as adjustable as it seems. About half a dozen positions are useful. (Below) Overall lines give away the SFC's heritage. It is a road racer that happens to have lights.



(Right) Front stopper was faultless but the bike had a heavy feel while braking. Switching the calipers to the rear of the legs would alleviate some of this. (Far right) Switches, once again ND items, were well placed. Choke lever was needed only for cold starting. Notice the Allen bolts for bar adjustment. With the bars in this position, the riding position was just about the same as with clip-ons.



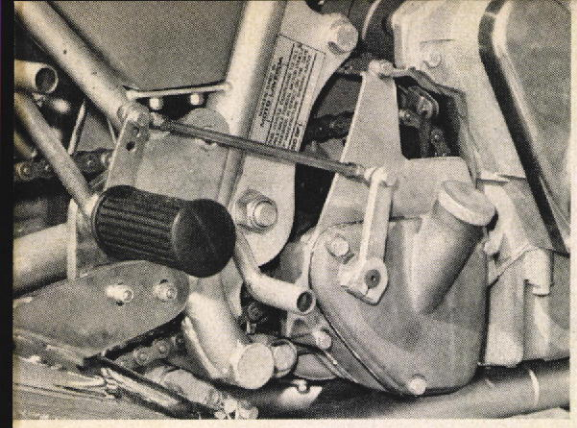


seems to like them for one reason or another, mainly because their faults are easily overlooked. If there is a sloppy weld here and there or if the fiberglass looks as if it was laid on with a trowel, the natural reaction is to say that "It's Italian." The SFC is Italian in every sense of the word. The attention to detail is confined to where it really matters; in the handling, stopping and reliability departments. From the silver painted frame to the bright orange paint scheme, the bike can only be described as delightfully functional.

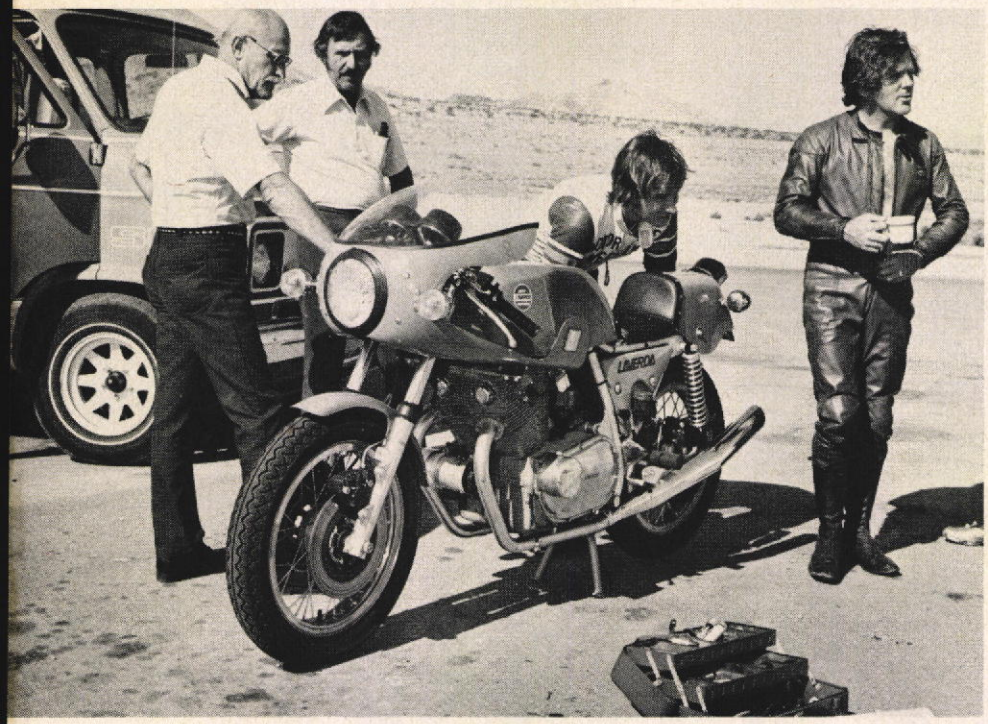
Italian motorcycles have always been known for fine handling characteristics and the Laverda is no exception. Laverda has been around as long, if not longer, than most of its home country competitors and their attention to the fine points of handling is brought to near perfection with their SFC.

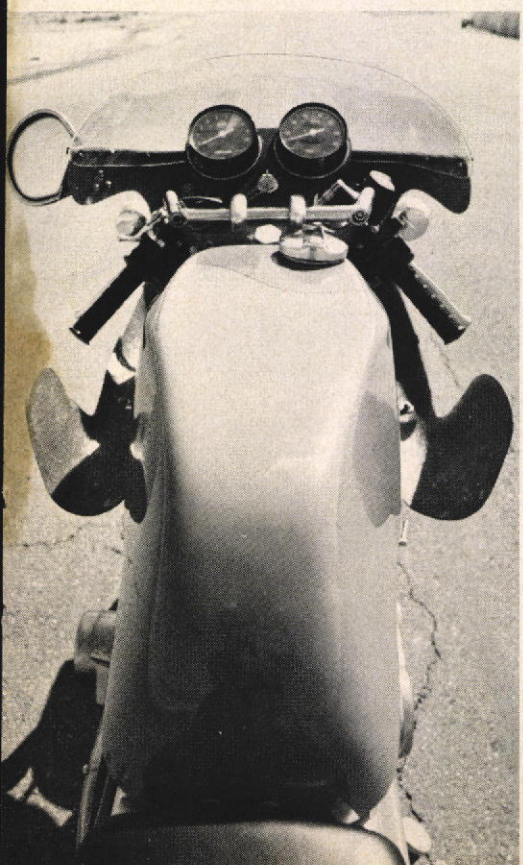
However, where Laverda is really scoring is that they have come up with a production racer that can be uncrated and taken to the race track with the minimum of preparation. Just take off the stand, stick on some numbers and you are ready for action, and if the event is running a few hundred miles or a few hours, you have a potential winner. If not, you can have fun zapping people in the corners and waving to them as they streak past you on the straights. How do we know? We did exactly that!

Laverda is currently in the process of expanding their U.S. activities and Continental Motorcycles of New Jersey, the sole distributors, have recently opened up a West Coast headquarters with Bob Hansen at the helm. Bob is better known for his managerial ability when it comes to race teams, to which Honda and Kawasaki will attest, and



(Left) Shift linkage was traditional Italian with heel rocker. Aft portion was never used during the test but by the same token it was never in the way. Shifting was precise although a definite jab was needed. Downshifting required a slight pause between changes to insure positive engagement. (Below) Howard Jackson a friend of Hansen's and long time Laverda lover, Bob Hansen, Weed and Murphy at Willow Springs.





(Left) Fiberglass tank seems high and wide but it didn't hamper riding style for 5' 8" testers. Mileage worked out to just over 40mpg on the road and 25 mpg on the race track.

now Bob has channeled all of that energy into his new enterprise, and more and more Laverdas are being seen in the Southern California area.

We received the SFC in a crate from the N.J. headquarters and after sticking the wheels in and mounting the fairing, we sat back and had a close look. The machine reeks of race heritage with its three disc brakes, tiny seat and monstrous tank. It looked like a racer but a quick trip up and down the street soon revealed that it didn't have the pep that is usually associated with bikes of this nature.

Putting some miles on it over the next few weeks in and around metropolitan L.A. soon proved one thing; if you want an around-town cruiser, choose the milder SF Laverda, as the SFC isn't at all happy in traffic. While the bars are adjustable, the rest of the machine is designed with your hands and arms almost straight out so we found that the near clip-on position was best. This alone hampers you in tight situations but the fact that you are reaching out over three feet of gas tank didn't make things any easier.

Winding roads were another matter altogether. Once the bike had any noticeable forward motion, the heavy feeling was gone. Although it tips the scales at just under 500 pounds wet, it could be flicked around like a lightweight. This led to Phase Two of the test, a day at Willow Springs Raceway.

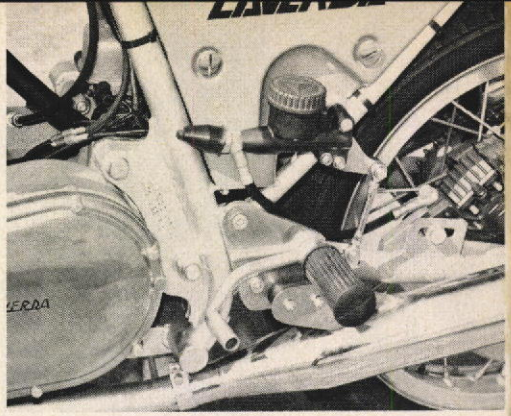
It didn't take too much to convince Editor Tony Murphy to come along and Bob Hansen was eager to see just what the bike would do throughout a day of thrashing. This is when we found out the difference between a production racer and a *long distance* production racer.

The amount of preparation consisted of topping off the fuel tank and checking the oil level. We had already replaced the as-delivered open megaphones with the no-cost-option mufflers, so we proceeded to put some laps around the bumpy, undulating circuit nestled in the remote foothills of the California desert. Three hundred miles later we were convinced. The bike was stable at high speed but slow down the straights, and felt like it was indestructable.

By the end of the day, it was running as good, if not better, than when we arrived. We changed back to the meggas, with the necessary change in jetting, but no appreciable gain was noticed. The only thing that worked loose was a carburetor bell mouth. The electric starter, as well as all of the electrics, were in perfect working order and the bike could be perked into life with the push of a button, idling smoothly and steadily at 1200 rpm. This was after a day of pretty hard riding at competitive speeds. It might not have been as quick down the straights as some multis or faster twins but it made it up in the swervery and it would keep it up indefinitely. It was a little easier to see whay Laverda takes such an interest in events like the Barcelona 24-Hour, the Thruxton 500-Miler and the other major endurance production races in Europe. Whether they designed the bike for these events or these events just happen to suit the SFC doesn't really matter. What does matter is that the bike is a winner in these types of events. This brings us to Phase Three.

The caller on the other end of the phone was one of the better known motorcycle journalists from another magazine. When asked what he thought of one of the hot new enduro bikes, taken by nearly everyone to be one of the best around, he quipped: "It's awful. It hops around and it doesn't have enough poke but I guess it is alright for an enduro bike." It summed up a great fallacy in the testing procedures of many publications. He had spent a day of hard riding, treating the

LAVERDA 750 SFC



(Right) Master cylinder for rear disc lives in little notch of side cover. Brake was sensitive at first but soon settled down.

LAVERDA 750 SFC

TEST BIKE

Base price as tested	$3520.00
Factory warranty	12 months, 12,000 mi.

ENGINE

Type	4-stroke twin
Displacement	743.9cc
Bore x stroke	80mm x 74mm
Claimed HP @ RPM	75 @ 7500
Claimed torque @ RPM	N.A.
Compression ratio	8.9:1
Lubrication system	Gear pump
Carburetion	Dell 'Orto twin 36
Air filter	None
Ignition system	Battery/coil/points
Electrical system	12 v.
Starting	0.95 hp electric
Exhaust	Twin downswept mufflers

DRIVE TRAIN

Primary/ratio	2.2:1
Transmission/shift	2.2:1
Gear ratios	2.6:1; 1.8:1; 1.3:1; 1.1:1; 1.1
Final drive/ratio (sprocket teeth)	variable

CHASSIS AND SUSPENSION

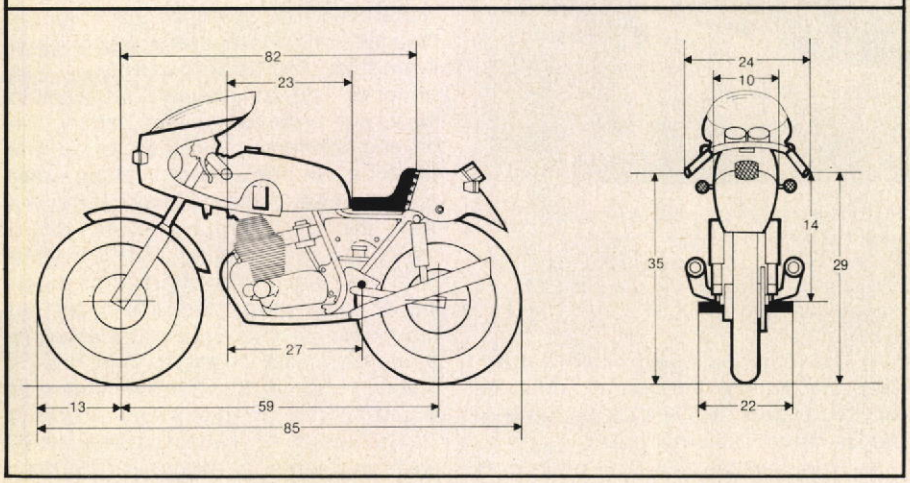
Frame	twin top tube, no down tubes
Suspension,	
front	Ceriani
rear	Ceriani
Turn radius	N.A.
Brakes,	
front	Twin 10½" hydraulic disc
rear	Single 10½" hydraulic disc
Tires,	
front	Pirelli 3.50x18
rear	Pirelli 4.00x18

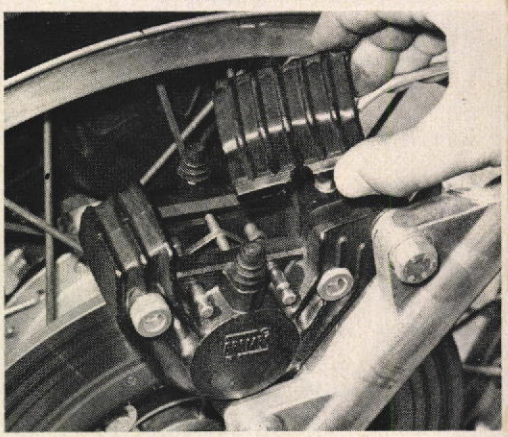
WEIGHTS AND CAPACITIES

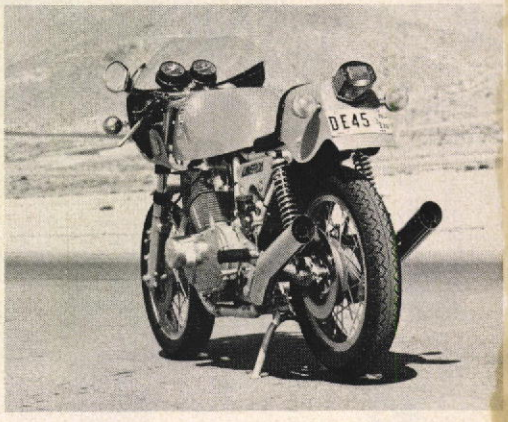
Weight, wet, unladen	498 lbs.
Allowable gross weight	N.A.
Fuel capacity	5.4 gallons

STANDARD EQUIPMENT

Speedometer	Yes
Tachometer	Yes
Tools	Yes
Stands	Center
Passenger provisions	None







(Above) Inspection covers for front disc just pop out, revealing pucks. Useful. (Below) Foot pegs are high but don't cramp riding style. Exhaust pipes are tucked under the engine and exit with upswept design. They couldn't ground.

bike as if it was a moto-crosser and his resulting words of wisdom will no doubt reveal that the bike doesn't make it as a moto-crosser. What he failed to grasp, even when he said it, was that the bike was never intended to be a racer in the first place and as an enduro bike, it put most of its competitors on the trailer.

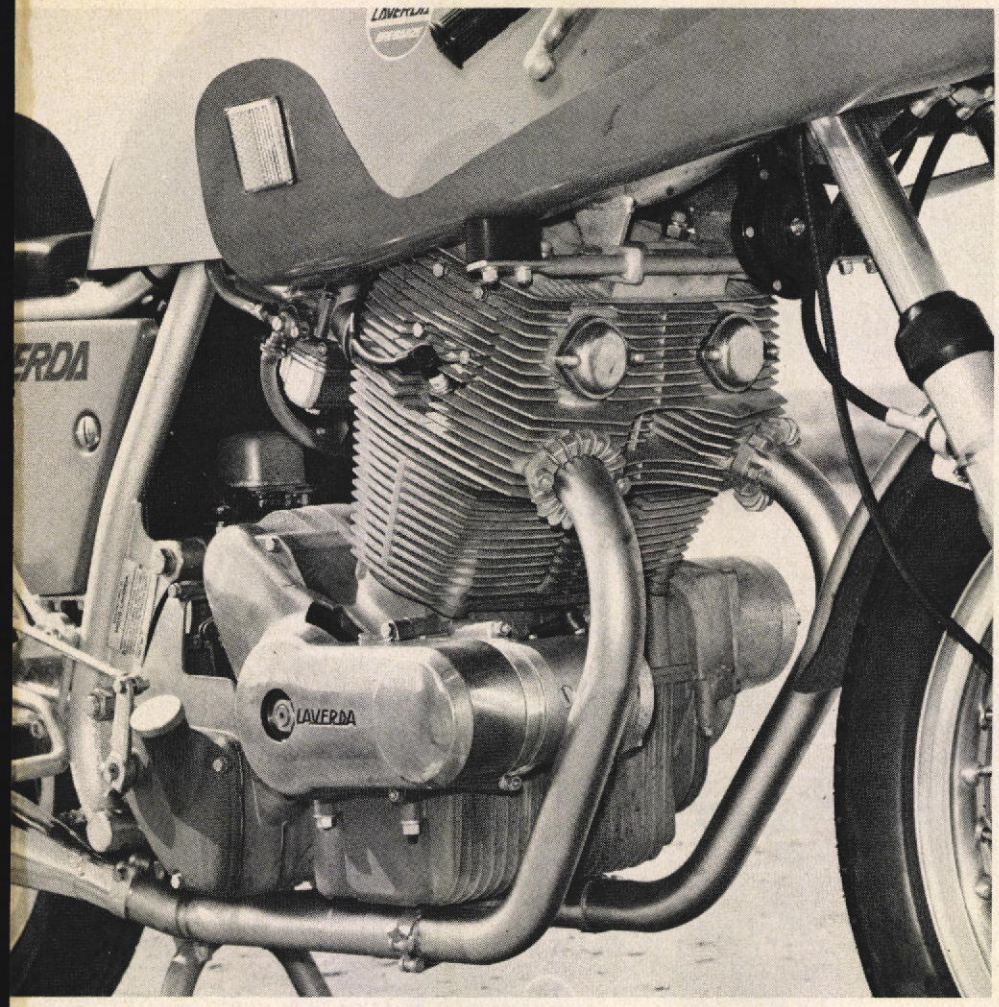
It only followed that if we were testing a production road racer, we should production road race it. As it happened, the American Federation of Motorcyclists was having a 150-mile, two-rider production bash a few weeks later at nearby Ontario Motor Speedway. This time it took a little more convincing to entice Murphy out of retirement but he soon consented after hearing all of the arguments about "a second opinion how about if I get tired, it would be good for the magazine," etc. I'm sure the fact that he wanted to ride played a major part in this decision.

We found out at Willow that the bike could pull a lot more gear and we had really scrubbed off the right side of the sticky Pirelli MT11 rear tire. Bob Hansen chimed in that he had another machine that was slightly damaged in shipment and we could pull the rear wheel off that, and also that he had a selection of sprockets to raise the gear. We were in business.

The event was a two-day affair and we spent Saturday re-learning the track and seeing just how undergeard the bike was. At least three teeth would have to come off the back wheel, but Bob wasn't scheduled to arrive until Sunday morning. The bike was being blown off on acceleration as it was by a horde of 900cc machines and a higher gear would only make matters worse, but we had to pull as high a gear as possible to keep the vertcal twin within its 7500 rpm red line down the never ending long straight at OMS.

We changed the gear on Sunday morning, dropping four teeth from the rear wheel, hoping that the relatively mild powerplant could pull it. Practice was already over so we just hoped for the best. Murphy was going to ride the first 75 miles and I would finish the race, if everything went according to plan. It did.

There is no use going into a race report as 150 miles is not quite an endurance in the pure sense of the word. There was no fairy-tale debut for the orange Laverda. In fact it was pretty severly trounced by a 900cc BMW and



(Above) It is easy to see where the overgrown 305 Honda stories started. Electric starter, the only starter fitted, nestles behind cylinders. Note massive sump and seperate oil filler in gearbox cover. Pipes are painted silver as is the frame. (Left) Tool and storage compartment in seat is useful item but flip-up lid is too small. The compartment is large enough but the door limits what can be put in. As it doesn't lock, perhaps this is a good idea. Seat was short but comfortable.

a 900cc Z-1 Kawasaki, but it must be remembered that the BeeEm was an entry from Butler & Smith and although legal in every sense of the word, it was far from being your box stock variety, and the Kaw was entered by RC Engineering who make more speed goodies for the four-cylinder machine than you can shake a stick at.

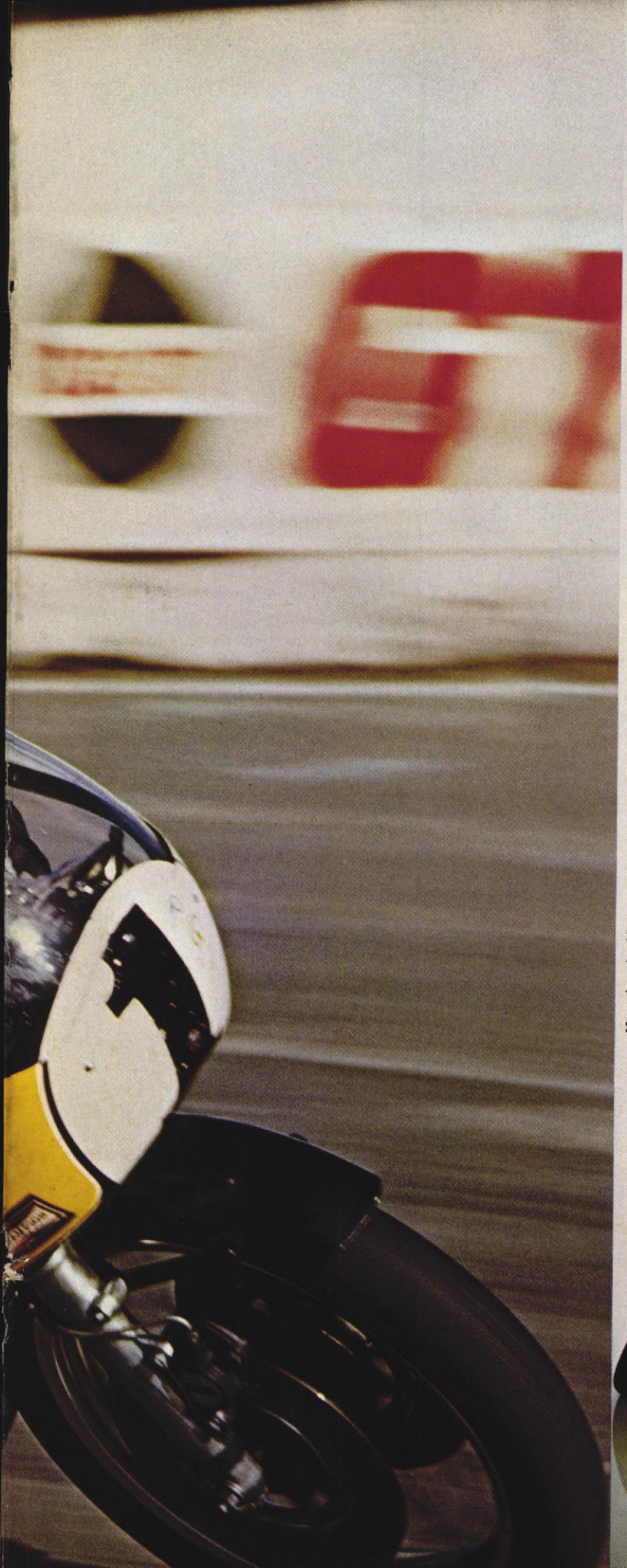
We know how stock the Laverda was. Nothing had been done to the engine except a jet change and a switch to racing plugs. The center stand was removed, home-made numbers were thrown on and the gearing changed. Aside from that, the bike was just like it left the crate and it was probably the only bike in the race so innocently equipped. It surprised most people, including us, with the way it could be flicked through the infield. It was definitely outpaced on the straights but it wasn't losing out on the rest of the track and many of the machines entered had a full season of engine and chassis mods to make them competitive.

But if it is so down on horsepower, how can it win races? This is the obvious question and one that is hard to answer. It must be remembered that the factory built the engine on the mild side so that it can finish 24-hour events and not to scorch around short circuits for eight or ten laps. They claim 75 horsepower and although we didn't get the bike on the dyno, it was obvious that Italian horses are a little on the small side. Perhaps they will produce a more potent engine for short events, possibly forsaking the reliability factor. No doubt serious buyers of the machine will soon have speed goodies galore as the supply of accessory parts is only governed by demand. Or on the other hand, the swing to long distance production racing could be floating across the ocean at this very minute, and if and when it ever does occur, Laverda will be in on the ground floor.

Right now Laverda is trying to establish that foundation as far as sales and they are trying to live down the overgrown Honda 305 syndrome that has been plaguing them as well as a short-lived entry on the American market as the big-bore machine in the ill-fated American Eagle range. The SFC is as far removed from these as night from day, so they should overcome that in short order.

What they will have to really surmount is a high price of $3520 for a bike that isn't as quick as motorcycles costing a little over half the price. But the go-ahead Continental people are already working on this and have listed the SFC as a 'Limited Edition' model for the high speed, good handling connoisseur. For him, Laverda has already established healthy residence on the ground floor. •

BELL
GOODYEAR



When your two-strokes are winning all the races, people forget that you also make four-strokes.

For those who suggest Yamaha makes only two-stroke machines, we have a couple of powerful arguments.

The 1975 XS650, and the 1975 XS500.

The XS650 twin is the Yamaha street classic—the object of greater owner loyalty than any machine we've ever produced. Stock, with its simple, almost vibration-free SOHC engine, the XS650 has been acclaimed as one of the most reliable tourers made. Slightly modified, the XS650's performance and handling helped AMA Champion Kenny Roberts chalk up more winning points than any rider in history.

The XS500 is not only a relatively new machine for Yamaha, but in fact an entirely new motorcycle design. Its double overhead cam, eight-valve engine is the most advanced vertical twin ever built. And Yamaha's exclusive Omni-phase® Balancing has reduced vibration to a level comparable and even superior to that of multi-cylindered machines.

So, if you're thinking about a four-stroke street machine, visit a Yamaha Dealer and see the 1975 XS650 and XS500. Once you ride, we think you'll agree our four-strokes on the street are just like our two-strokes at the track.

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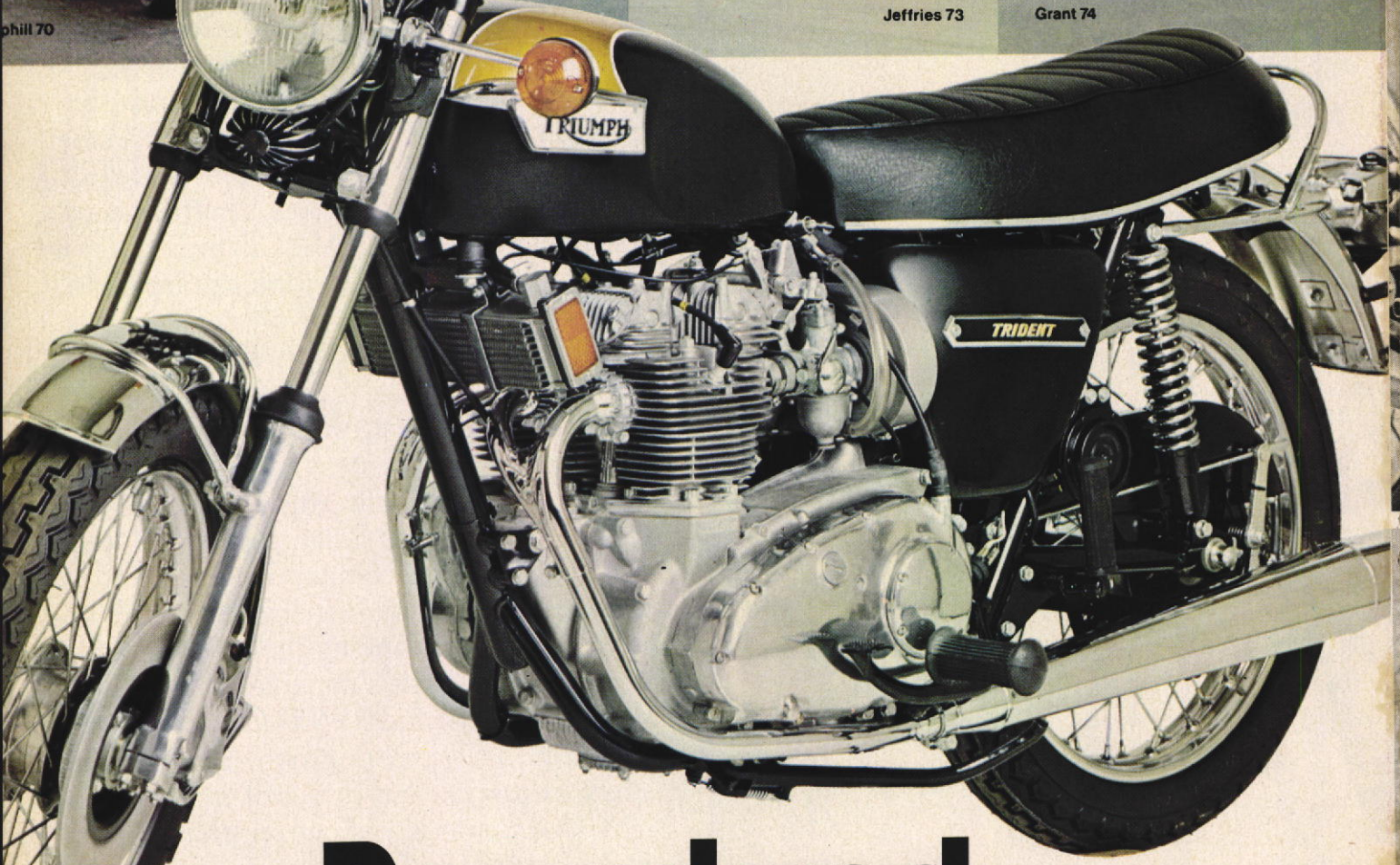
The new Yamaha 4-stroke XS650.

The new Yamaha 4-stroke XS500.

Someday, you'll own a Yamaha.



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MIC

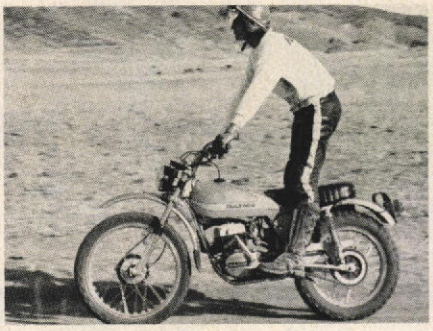
BULTACO'S CHROME-MOLY

350

ALPINA

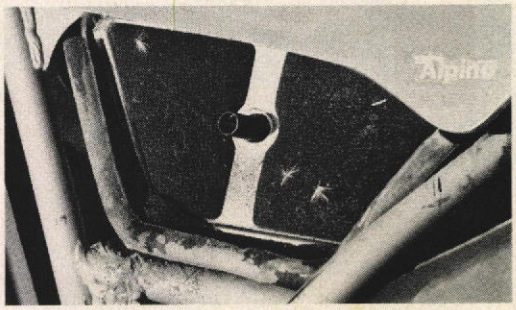
BRAKE YOUR
RIGHT FOOT
SHIFT WITH
YOUR LEFT

Handlebars determine where you sit on the seat; footrests are responsible for getting your knees into the grasshopper position.

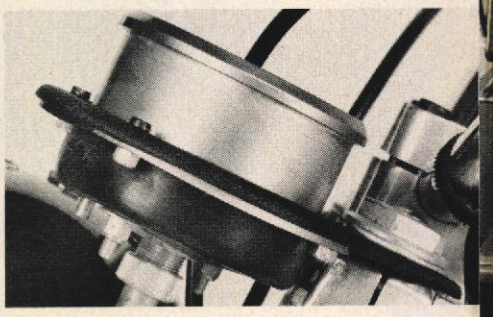


Stand-up riding is almost correct for this 6-foot rider. Taller bars would allow him to bend less at the waist.

Shift lever is just an inch away from toe of size 11 boot. You've got to get off the peg to change gears.



Air filter is oil wetted foam type. Small pad is easy to service, adequate for 350 but doesn't surpress noise.



New speedo mount has eliminated Bultaco's "rotting rubberband" problem. Mounting plate is non-glare crinkle finish, trick.

350 ALPINA

Ever watched observed trials competition? Put you to sleep? Nobody goes fast, no danger, thrills or spills? No wonder you've never seen one, most other people haven't either. Observed trials seem to gather only those keenly interested in the sport.

And that makes us wonder how come so many of our motocross and other racing champions spent their first competitive years in observed trials competition. Even Jacky Ickyx, the Belgium car racing champion, won his country's observed trials title before he tried motocross, road racing, and eventually four wheels.

You could say observed trials is the primer to all forms of motor racing. It teaches you balance and how the application of power works. Concentration and determination, those two ingredients so vital to becoming a champion of anything, are the very crux of observed trials competition.

But you can't do it properly with just any old kind of bike; it takes a special one. Trials motorcycles practically turn within their own wheelbase, climb vertical walls from a dead stop, and wheelie all day. All they need is a rider of considerable skill.

Now Bultaco's Alpina is a derivative of that company's many-time World's Observed Trials Championship motorcycle. It's a bastard though, and came about because there's a definite need for that kind of mountain goat. This is how the Alp came to be:

Lots of observed trials bikes are sold that never see an observed trials. The guys are taking them off to the woods or up in the mountains to quietly ride trails and paths without so much as snapping a twig or spoiling the surface. The bikes are extremely light, making them ideal for mountaineering, and the engine's power to the rear wheel is as soft as a down pillow. Knobbies are never worn, trials tires do the job.

Problem with a pure trials bike for an all-day outing is a lack of fuel capacity (good for about 40 miles), too hard a saddle (trials riders stand up a lot), and the gear ratios are funny (trials bikes use the first three very close to each other).

Why not use an enduro bike instead, you say? Well they're heavy, don't turn too sharply, and most have the wrong kind of power. Some guys would rather bolt on a big gas tank, pad the seat and ride their trialer.

So along came the Alpina. Mister F.X. Bulto was the innovator (with the help of Sammy Miller) of the 250cc 2-stroke observed trials motorcycle. Mister Bulto is also a purist. He builds a Pursang for motocross, Matador for ISDT competition, the Astro for flat tracking, Sherpa Ts, and very fine road machines called Metrallas. Although sharing many of the same pieces, they are all specialized motorcycles with their own identity. Had Mister B known what the factory was up to in creating the Alpina it would have been squelched before that first fat-saddled, blue-tanked bike ever saw the outside of the adobe walls where it was assembled. "Sacrilege" he would shout, and the bike would have been dismantled, its pieces flung to the winds, with no chance of reconstruction.

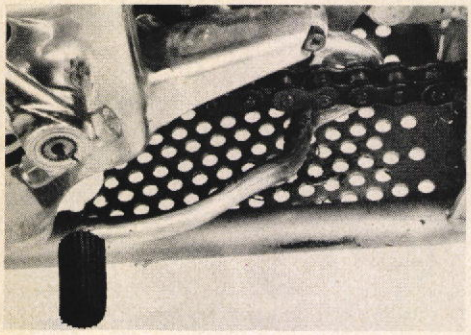
Those early Alps were simply Sherpa Ts with Matador observed trials gear sets and a fuel tank/seat of its own, certainly useless for work. The first change was shelving the skinny trials rear shocks and mounting Matador units, the seat got fatter too.

After two years a new frame, glass, and triple clamps made it into a different kind of Alpina; they also added a 348 engine. The new Alp went from 230 to 246 pounds full of gas, gained height from a still fatter seat, and got big lights as it started leaning towards the street.

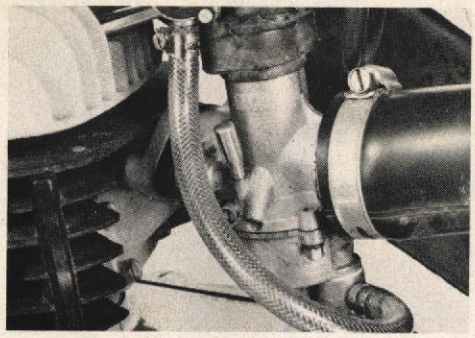
Now the Alp is firmly placed in the market, it's the bike for going where, if you had no other choice, you'd walk. Because it's not meant to be ridden fast, it has very soft suspension. Both wheels follow the terrain rather than hitting the high spots, allowing good control when everything gets gooey or bumpy or both.

Basic change on the new frame ('74) was an increase in trail. They did this by using MX triple clamps that bring the front axle closer to the centerline of the steering head. (The MXers have still more trail because their front axle is directly under the fork slider while Alpinas and Sherpa Ts have the axle in front of the slider.) It was taller, braced more rigidly, and weighed 16 pounds more.

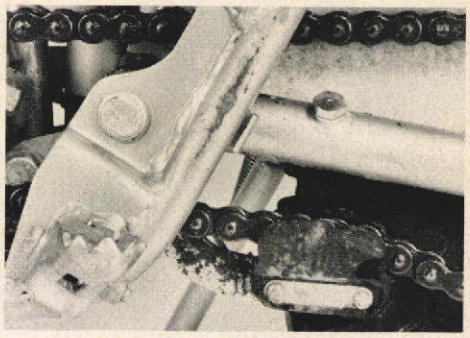
'75 becomes the year of the "left side shift" Bultacos. This irks F.X. Bul-



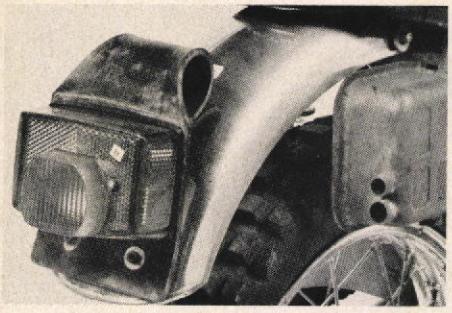
Here it is folks, the shifter on the left. Aluminum arm has more bends than the letter "S"



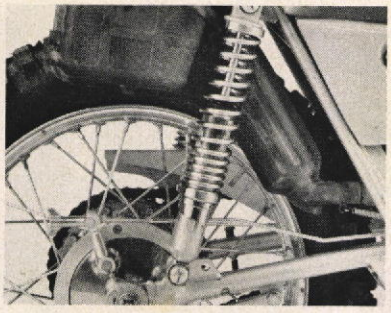
27mm Amal carburetor is mounted on angle to allow "cooling room" between it and exhaust pipe.



Trailing chain tensioner has high walls so chain won't jump off. Aluminum nut on swing arm is filler for chain oiler.



Huge taillight is mounted on rubber chunk. Exit tubes in muffler are strange but sneaky tone is appreciated.



In profile, muffler looks like pregnant boomerang. New rear wheel has right side brake with reverse side capabilities.

350 ALPINA

to because he says if you stand on your left foot you stick out your right hand for balance. That means that with the throttle already at the right hand, the clutch has to be on your left so the shift lever must be for your right foot. It ain't no more.

Bulto relented begrudgingly (after a fight) to the new Federal regs, but with reservations. You can still have right foot shifting on your Bultaco. He left the splined shaft for a shift lever on the right side. The entire rear wheel flops over and the sprocket will bolt to the brake side. You only need to weld a tab on the swing arm for the brake anchor. Find the old-style shifter and brake lever and you've got it. Now you can stand on one foot and wave the other hand.

That wheel itself, both wheels in fact, are the most advanced and sophisticated found on a production off-road motorcycle. Although hard-chrome plating aluminum friction surfaces for long life has been possible for many years, we've only seen it on rare occasions in cylinder bores of motorcycles. Aerospace has been into it for decades.

The wheel hubs of both wheels on the Bultaco are eggshell-thin aluminum forgings. The area that makes contact with the brake shoes is hard-chrome plated, a .005-inch coating (about the thickness of one of Bulto's whiskers) that rates near tungsten for hardness. The advantage is lightness. Normally there would be a thick cast iron or steel liner sleeve in the aluminim hub for the brake shoes to rub against.

A two-piece bolt-up assembly makes up the rear hub. With the sprocket carrier opposite the brake drum, the need for different length spokes has vanished. The Alpina rear wheel is the same as found on Pursangs, 8-gauge spokes and all.

The conical hub on front is shared with the Matador. Non-lipped Akront hardened rims, stainless steel spokes and aluminum alloy nipples help in making these the very lightest weight wheels in the industry. Patterned after the tiny Pursang front brake, the Alp's is larger and fitted with an internal speedometer gear set.

Bultacos are surrounded with innovations for improvement. These speedometer gears used to be of cast iron, they needed lubrication and a working area free of foreign matter. Sometimes a machine chip from some previous machining operation would get drawn in by the grease and the gears would grind to a halt. Currently a nylon ring gear has been substituted to ride against a metal pinion without lubrication. So far the system is pretty successful.

But not all these progressive ideas from the Barcelona factory have worked out. Second generation Alpinas were using a double O-ringed cork for a gas tank cap. The thing took Hercules fingers to remove and was just as difficult to force back into the hole from which it came. Solution; return to the old screw-type.

Actually, the best step forward made with the '75 model is the switch to a chrome moly steel tube frame. (That is if you're not freak about which foot you like to change gears with.) Dimensionally the same as last year's "longer-taller" Alp, the change in material saved them a total of 8 pounds on our balance beam scale. The '75 works better for still another reason, its got a longer wheelbase because the swing arm is longer. The bike rides a little softer and turns a little slower.

Hanging in there with this "slower" theme is a one-third-turn throttle, several pounds added to the flywheels, a tiny 27mm carburetor, and "pregnant boomerang" after-exhaust system. Together these are the things that make you think the engine is really an electric motor hiding inside motorcycle engine cases and castings. The rubber-housed throttle is an electric rheostat. Power, although there's not much of it, is that smooth and controllable. If you want to learn to do wheelies, this is the bike to use.

That "thing" on the end of the exhaust system does come off without too much effort. Without it the Alp makes noise (it didn't before) and actually runs a little stronger. There is no exhaust tuning in these engines. Small carburetor and mild port-timed observed trials-type horsepower doesn't require expansion chambers. There is a glass pack muffler ahead of the "boomerang" that keeps the note down for a few hours running until the glass has "packed." Then it's just plain obtrusive.

continued on page 81

They're here. The mighty machines.
The new 1975 V-twins from Harley-Davidson.
Those beautiful brutes that no one else builds.
The ones with that special Harley-Davidson sound that's music to your ears.
XL-1000. Electric start. And really go. And its sidekick, the kick-start XLCH-1000.
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The V-twins are in. And they're at your Harley-Davidson dealer. Come on in and take a look. Talk about freedom!

AMF
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Harley-Davidson believes in safety first. Before you start out—put on your lights, your helmet—and watch out for the other guy.

The Great American Freedom Machines.

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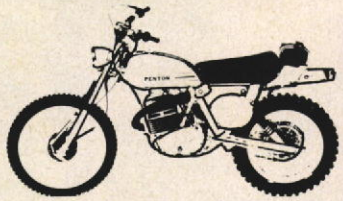
A TALE OF 250cc



Can You Live Happily Ever After When the Honeymoon Is Over

In spite of their popularity with readers, magazine road tests do have their shortcomings. Providing that the tester is qualified to pass judgements on the functional aspects of a particular machine, a prospective buyer should have a good idea of the performance capabilities before he makes his purchase. However, what he really has no way of knowing is just how much money it's going to cost him to maintain that new purchase. Unfortunately, road tests are seldom of enough duration to answer that question for him.

We've long been aware of this fact and last year we undertook to conduct a year-long road test of two off-road machines. Since all the staff members ride almost every weekend, that in itself was no particular hardship. We made arrangements with Penton and obtained two brand new machines for enduro use; a 125cc and the all-new 250cc Hare Scrambler. The 250 version would prove particularly interesting since at a suggested retail price of $1595 it is one of the most expensive 250 machines ever.

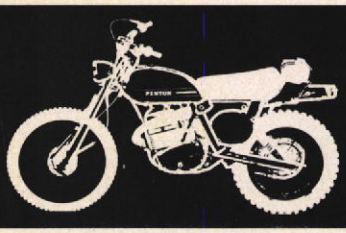
Both machines were delivered to us at the annual Daytona 200-miler last March. We had entered them in the Alligator enduro to get a taste of Southeastern Enduros and would then return them to California for use in desert-type enduro events. Only when we look at photos of the machines taken in Florida do we realize how shiny and new a brand new machine can be. To look at them now one would think they'd been ridden a whole lot farther than the 1500-plus miles indicated on the speedometers.

The Alligator event was a fun enduro aimed at giving eastern enthusiasts an opportunity to participate during the annual speed week festivities. A short enduro, some 65 miles, it wound its way through the swamps and forests of Florida's eastern coast and gave us an adequate opportunity to become familiar with the Pentons. The 125 was ridden by Motorcyclist's advertising

In March of 1974 both the 125 and 250 Pentons were brand new. On the starting line of Daytona's Alligator enduro, the 250 is flanked by two of Penton's Pentons. The 250 of Jack Penton and Larry Myers' 125.

Enduros start early in the morning. The first time out for the new Penton duo was uneventful. All went well and we managed a second and third in the Press category. Later events would prove much rougher.

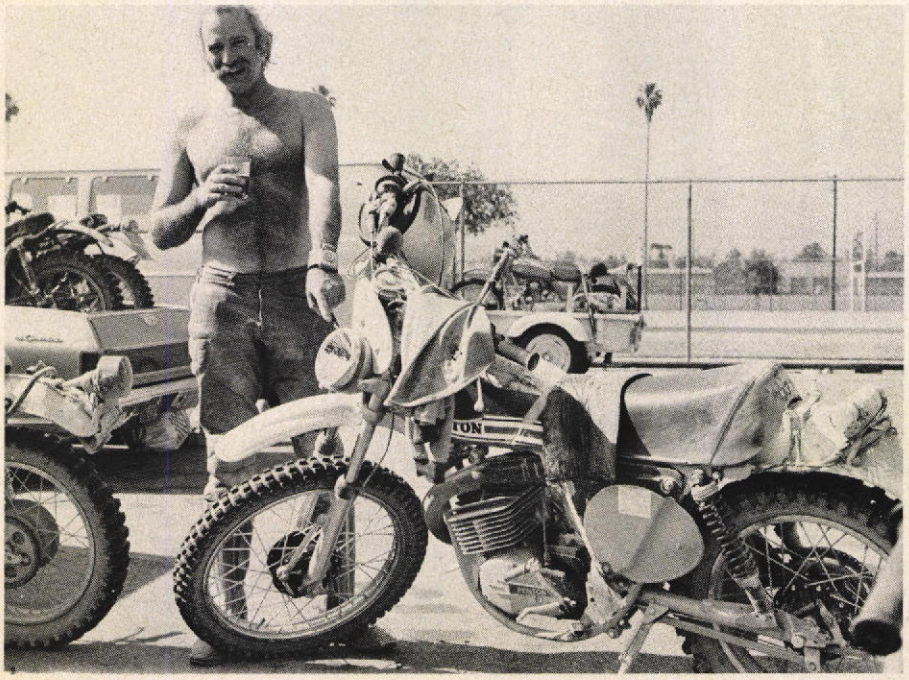
2 PENTONS



125cc

by Tony Murphy

George Clark is a six-footer weighing in at 210 pounds. Not the ideal for a 125 anything. More used to riding 250s. George's reactions to a smaller-engined machine proved interesting. He's still riding a 125.



Two months and over 500 miles later, the 125 shows definite signs of two days of hard use in the Greenhorn enduro. Despite its appearance, the 125 ran faultlessly, sustaining most damage from a fireroad crash.

representative, George Clark while I piloted the 250 version.

The Alligator was uneventful. No obstacles proved to be too much for either machine and we completed the event without incident. During their post-race wash, it was noticed that the 250's shift lever had come out second best after tangling with a tree stump, but all else was much the same as it had been before the start. All else, that is, except for our new found respect for the machinery. We'd long known how good the machines were supposed to be under such conditions, but the 250 was brand new and we'd never ridden one before. After that 65-miler we'd found a new love as far as performance. It only remained to find how long the romance would last if we were footing all the bills.

Back in California the machines were readied for some western style enduros. George felt the 125 was just right so concentrated on nut and bolt tightening. My 250, however, had impressed me as being a little soft in the rear so a set of heavier S&W springs were fitted to the Koni rear units. We consider that a mere adjustment and the fact they were too soft to begin with is the fault of no one, least of all Penton or Koni. All else was left the way it came out of the crate.

Even before the next event the 250 got a workout. Dave Ekins took it for a week and did a single bike test for the magazine. His views agreed with mine in almost every respect, adding a little confidence to the thoughts accumulated in those Florida swamps. There was only one mishap. That shift lever that had been bent earlier finally broke off, forcing us to install the one we'd thoughtfully taped to the frame. We'd been cautioned that the first batch of machines were equipped with very vulnerable alloy levers and that the later machines would be steel. Until we could get a steel lever it was felt a good idea to carry a spare. By this time the 250 had well over 250 miles on the odometer.

Desert enduro time. Off we went

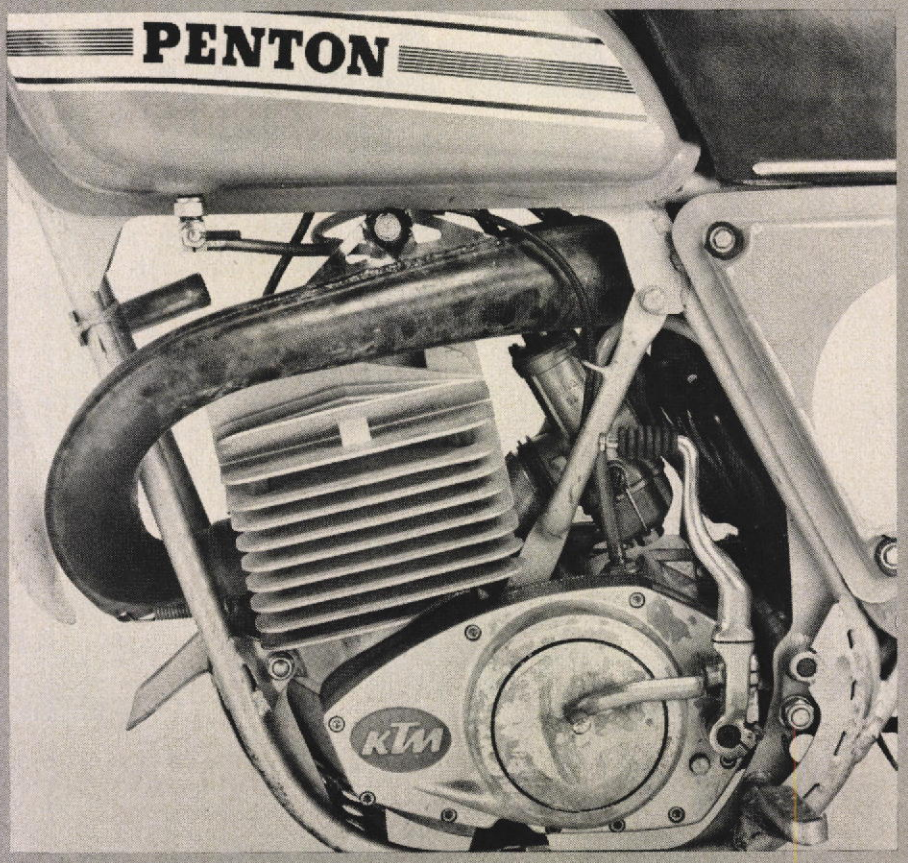
A TALE OF 250cc

to test the machines against the rocks, sand and dust. Neither air cleaner had been put to the test in the dustfree Florida air and there were few fire roads of the type that criss-cross the California high desert. After this first outing both machines were still performing just as they had from the first. Mileage: well over 300 and not so much as a chain adjustment on either one.

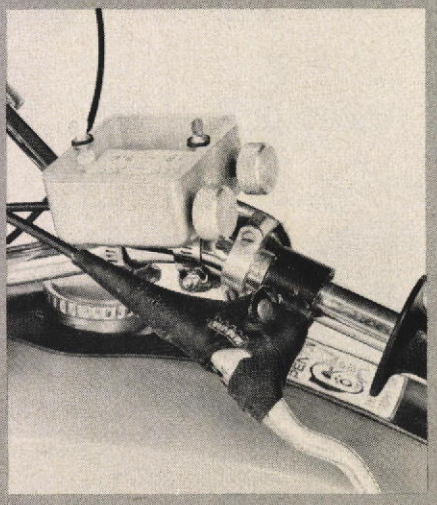
The next event on our schedule was a big one; the annual 500-mile Greenhorn. While neither machine appeared in need of any major adjustments, we felt that a little preventative maintenance would be the sensible thing to do. As it turned out it was a good thing that we did. While the timing was right on and few bolts or spokes had worked themselves loose, the 250 had developed a fracture in one exhaust pipe mounting bracket. No big deal with a welder at your elbow but a very big deal out in the middle of the Mojave desert. Checked, doublechecked and decked out with a few of the possible spare parts that a 500-miler can require, we were ready to go. From year to year one really forgets just how far 500 miles in two days can be. By about noon on the first day you begin to remember.

This particular Greenhorn gave everybody something to remember in the form of a 2½-mile section with a 3 mph average. Rocks the size of trash cans and a hundred or more stranded riders made the going rough for even the most determined. It was at this point, some 400 miles now showing on each Penton's speedo, that we first struck trouble. Clutch trouble. The 125's clutch completely disappeared. The 250's developed a good deal of free play but still offered some control. The skidplates got a workout too, and the second 250 shift lever broke in half. However, by the time we cleared the section and stopped long enough to replace the broken lever both clutches were operating normally. The constant slipping had taken its toll but once given a rest the adjustment returned.

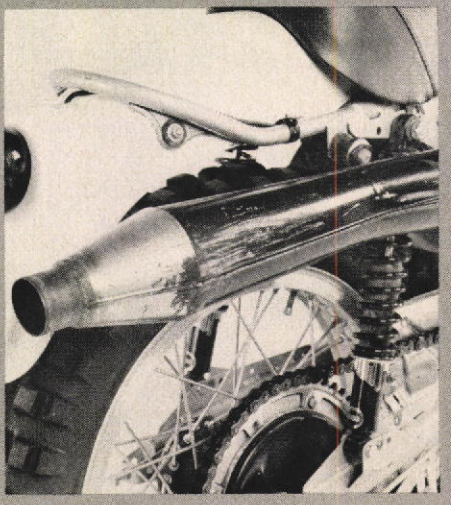
Pressing onward, the 250 developed another problem. The reset knob on the VDO speedo had disap-



The 250's engine unit proved to be indestructable. Throughout the over -1500 mile test it never (repeat NEVER) failed to start on the first kick. Exhaust pipe hanger beneath tank fractured and tank decals came off. There were two broken alloy shift levers before steel replacement solved the problem. Six speed transmission was faultless, as was clutch assembly.



We don't think we fall more than the average, but there's crash damage everywhere. In spite of the spills Magura levers stayed intact even though cover tore off both sides.

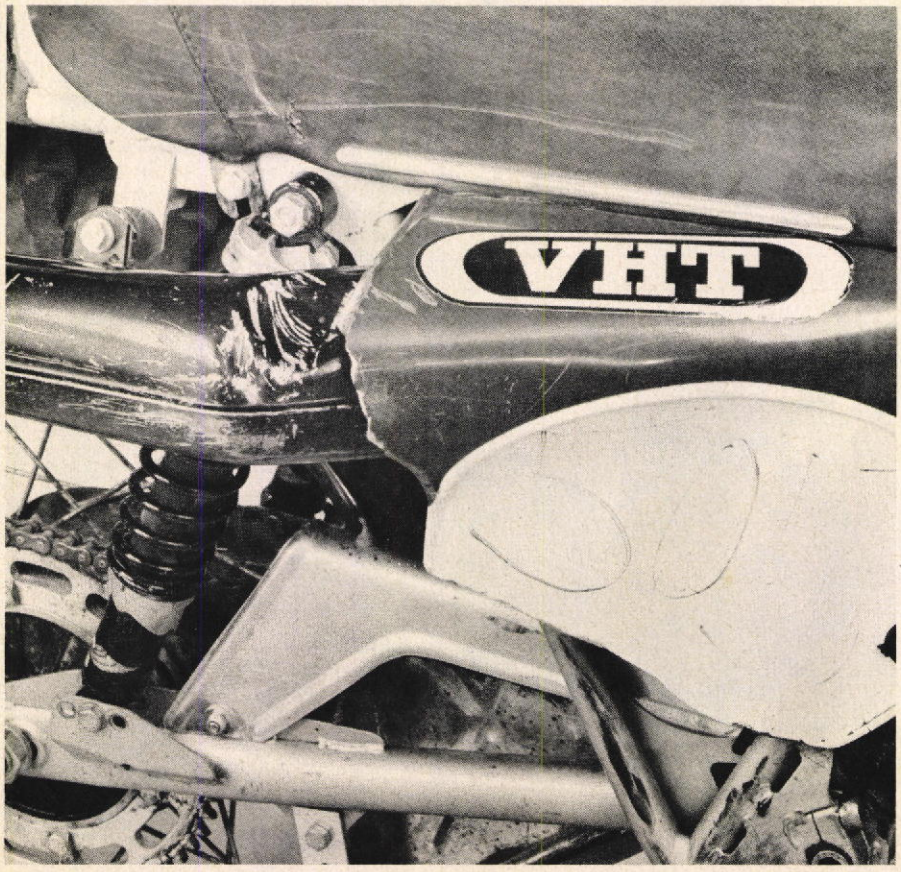


Vulnerable muffler also contacted ground on several occasions. Note welded extension necessary to fit a forestry approved J & R spark arrestor. However, muffler passes the rod test.

2 PENTONS

125cc

Showing all the signs of a hard life, the 125 still runs strong and long. It's never left George's 210 lbs stranded. It never will. The Konis on the 125 are still working fine but rear tire is now Goodyear Eagle.



Even after several heavy falls, damage is superficial. Fiberglass side cover was a victim of spill, as was the top of expansion chamber. The bulletproof nature of the 125 instills utmost confidence.

peared, leaving us without a means of resetting the trip mileage. George had cleverly applied some gorilla snot to his, but was to lose it later in a crash anyway.

By noon we'd done 120 miles, with 160 left before the end of the first day. While uneventful for either Penton we did get a scare, again with the 250. Without warning, the 250 fouled a plug. A few miles later the replacement fouled. By this time the 250 was straggling since the rest of the team went ahead in order to maintain the schedule. With the last spare plug installed, and fingers crossed, I headed off in pursuit. A few more miles and the engine again sputtered to a stop. And all I had was a pocket full of wet plugs.

Resting, yet frustrated, a passing rider showed sympathy and gave me another plug. However, it was considerably hotter than the one recommended for the 250 so the throttle was used with discretion. Finally reaching the finish, some 20 minutes late, a full scale investigation revealed nothing abnormal. The hotter plug had cured the fouling problem, but was far hotter than recommended. As a compromise, since there was an obvious rich mid-range condition, the needle was dropped a notch and a plug mid way between what worked and what was recommended was installed. A Champion N3G got the nod and remains in the engine to this day.

The second day's ride was equally uneventful as far as mechanical failures but did result in some damage to both machines as the result of several spills. George's 125 spit him off on a bumpy fire road and sustained several dents in the tank and exhaust system when it landed upside down in a pile of rocks. The headlight assembly was all but destroyed but again the fault could not be laid to the machine itself. The same was true of the 250's front fender. It cracked when bike and rider ran headfirst into a large bush.

By the time we'd completed the entire 500 miles, rider fatigue tended to exaggerate each and every bump in the trail. For that reason the demise of the Konis must have gone unnoticed. However, by the

continued on page 79

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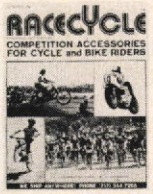

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COMPETITION HOTLINE *Continued*

In order to have a voice in the committee, a manufacturer must submit a letter of intent outlining his planned involvement in the 1975 program and specifying the team he wishes to support—Trophy, Vase, etc.

In the event that more than one manufacturer commits itself to a given team, the performance of each manufacturer's designated riders during the qualifying series will determine which company will support that team.

Actual rider selection will be made within two weeks after the final two-day event with three elements being considered in that selection; the results of the qualifying series, recommendations of the committee and past ISDT performances.

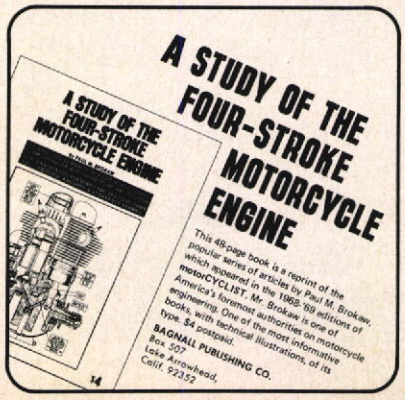
Primary emphasis will be placed on a rider's ability to complete the ISDT with a gold medal, with secondary emphasis on speed in special tests.

In the past two ISDTs, only the Czechoslovakian World Trophy Team has completed the event with all its riders still on gold medal standard, and the American Trophy Team has placed fourth each of those years.

Eames described the selection process as "a formula for victory in the ISDT." he said, "Up until now we have made every effort to select a team that could place well, but we have never seriously addressed ourselves to the kind of coordination of rider talent and support capability that is necessary to win. We've got a lot of good Six Days riders. This year we're out to put the whole package of rider and support together."

Riders will be scored in each qualifying event based upon their finish—six points for a gold medal, three for a silver and one for a bronze—and the total of their best four finishes will be the primary consideration in team selection. Considered second will be times in special tests, from which evaluation points will be calculated ISDT-style based on the fastest rider in each class. Finally, the total number of route marks (late penalties) during the series will taken into account.

Final decisions on team selection will be the responsibility of the AMA as the recognized American affiliate to the Federation Internationale Motocycliste.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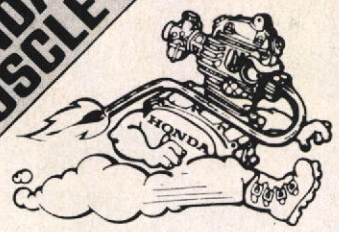

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WHAT MAKES REGGIE RUN!

by Mike Griffin

"An oddball, a paradox," some call it. And the skeptics—plus some realists—continue, "This sort of race effort can't be serious. BMW racing engines belong in sidecars where they can't lean over. What with their cylinders poking out sideways into the breeze, racing one of those would be like crop dusting with a 707. You just can't do it," they scoff.

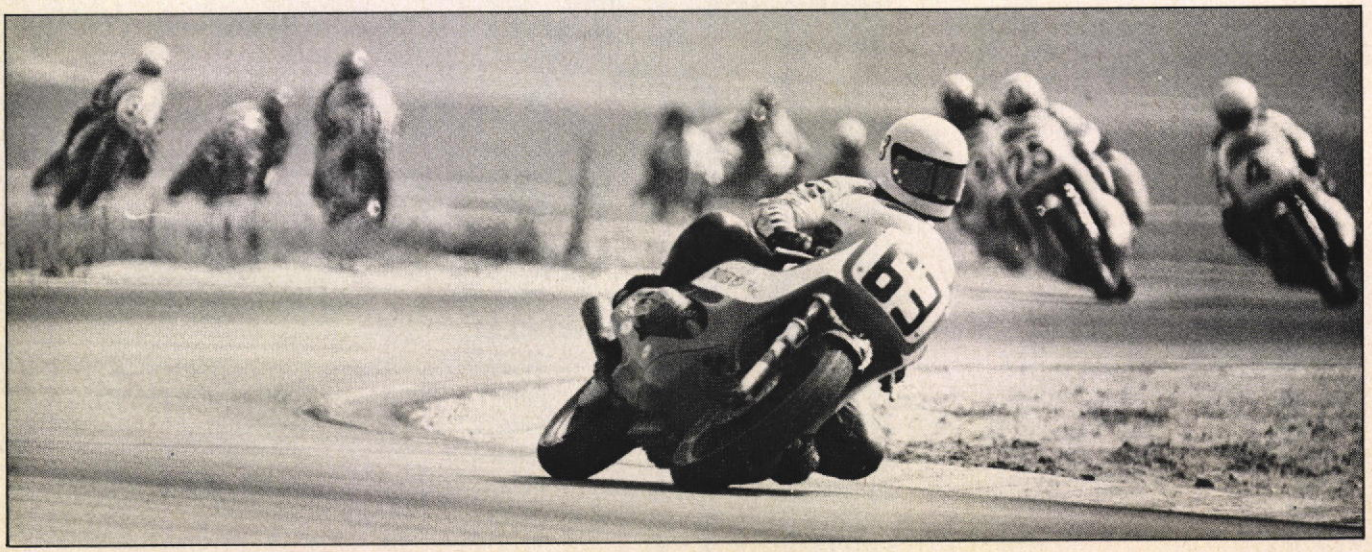
Of course, the motorcycle everyone's scoffing about is a bright orange and white BMW road racer emblazoned with the number 63 on its flanks. This is the machine Reg Pridmore campaigns in hotly contested AMA races throughout the year. Now Reg, in this age of multi-cylinder two-stroke dominance, is the first to admit that his mount is not what you'd call the odds-on pre-race favorite to win a given event. He and his sponsor/race developer, Butler & Smith (U.S. importers for BMW), realize that they have neither the time, money nor raw materials to develop a BMW-based bike competitive with the 120-bhp, 185-mph asphalt carvers currently ruling racing's roost. After all, the basic BMW opposed twin configuration has been in use for half a century now. And although it has proven itself a superbly reliable touring mount throughout the decades, it is in some respects a technological brontosaur. To say the least, the challenge is awesome. Or, to be less kind, as one of our century's contemporary poets said: "Wash a dog, brush a dog, comb a dog . . . still a dog."

And thus, the scoffers scoff.

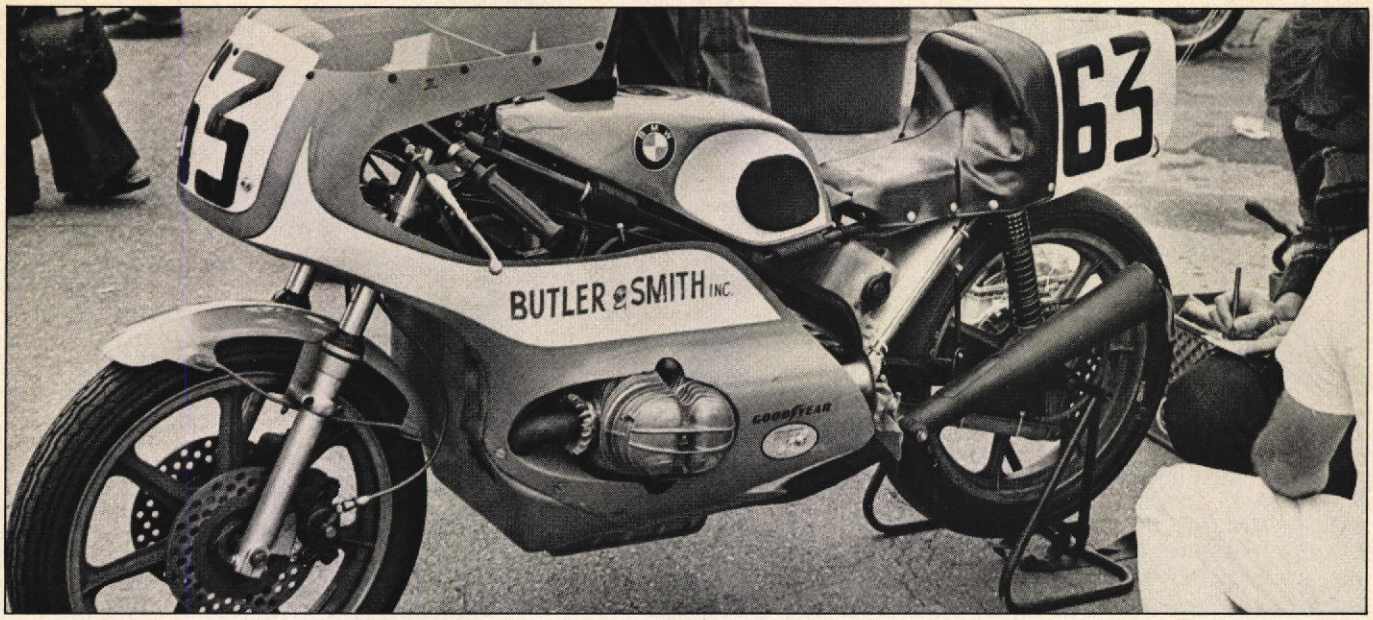
Through it all, however, the BMW stalwarts labor, devoted to their rumbling four-stroke twin, not caring a whit for criticism.

You see, you have to understand these guys—Helmut Kern, BMW West Coast boss, Miles Rossteucher, B&S Service Manager, Matt Capri, B&S Western Sales Manager, and others. You must understand their motives; the way they think. The bike Reg Pridmore rides is not just an object that consumes gasoline and goes rumpetty-rump. It is more than an assemblage of whirrs, clicks and bangs. Rather, it is a mission. Number 63 represents for these men a quest spurred by an ambition to keep the four-stroke rumbler alive and throbbing in the hearts of racing enthusiasts in the U.S. Clearly they feel it their duty to maintain the four-stroke's steady beat amidst the din and shriek of the countless two-strokes that swarm race tracks today like vengeful wasps.

Complicating matters is the *de facto* withdrawl from AMA racing of Harley-Davidson, whose severely outgunned 750 four-stroke can't handle the pace,



In a field dominated by shreiking two-strokes and mega-buck personalities, the pushrod BMW is an anachronism indeed. Nevertheless, it may be the fastest OHV twin road racer in AMA annals.



All-up weight of the racer is 310 pounds: somewhat heavier than the H2R Kawasakis, yet much lighter than the Yamaha 700s and Suzuki triples. Top speed is in the neighborhood of 165 mph.

until they can come up with more potent weaponry. Rumor has it, to make things worse, that H-D is defecting, if you will, planning a two-stroke four of their own. Of the only other four-stroke marque, well, Norton's financial labor/headaches have been much analyzed, so we needn't go further into that. They, however, have been burdened additionally by a spate of rider injuries. To boot, any enthusiasm they might entertain for the 1975 racing season is tempered by plans for a water-cooled DOHC twin for the following year.

So, the upshot of all this is that BMW alone is left to carry the four-stroke laurels. But to men like Pridmore, Kern and Co., men of discipline and confidence as well as competence, the challenge remains the same, and they remain undaunted . . . really.

It's much like the knights of yore and their holy appointed quests for that Holy Grail. For centuries and centuries iron-clad visionaries would kiss milady and the kids goodbye, then sally forth on Dobbin to find that nifty silver goblet. The fact that many thousands of these intrepid crusaders went a-searching for the vessel and only a comparitive few were ever heard from again—and nobody, but nobody found the Grail, of course—made no difference to succeeding high-minded men. And off they would go, too . . .

The point we're making is that it's the quest, the challenge, that's the important thing. The *means* is what counts and the end is, well, the end.

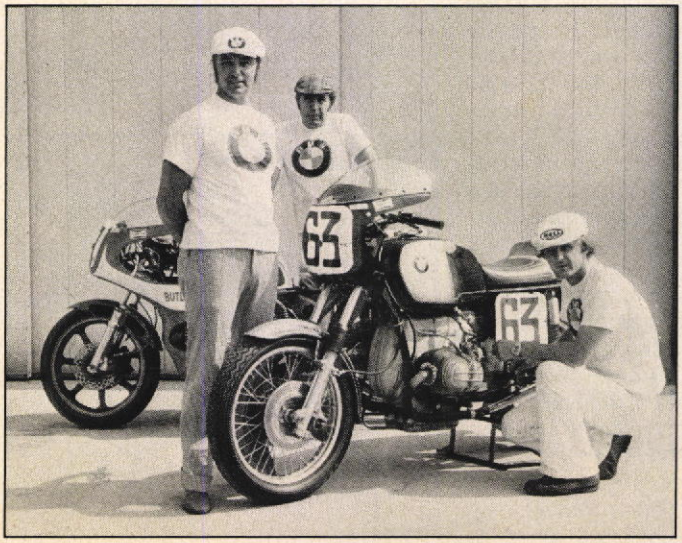
So now do you see why Butler & Smith have gone racing?

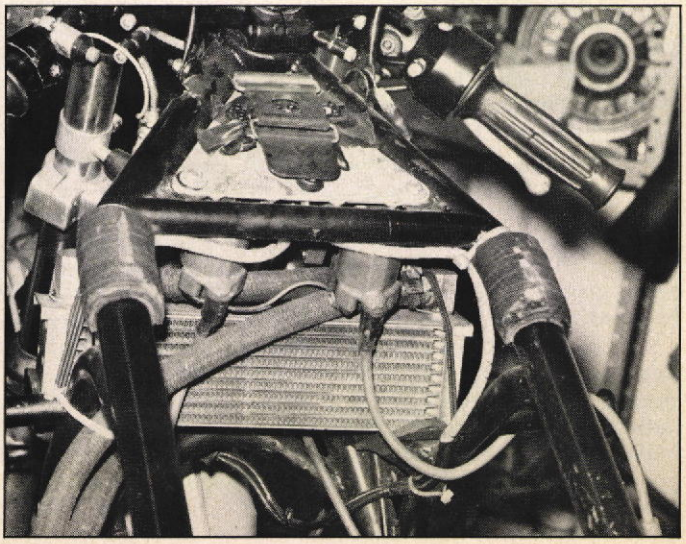
They have accepted this challange and intend to see it through. And don't be thinking that the parent factory, Bayerische Moteren Werke, is lavishing support, staffers and technology on B&S to assure a happy end to all these travails. They're not. The race effort shown on these pages is the sole result of B&S'ers here in the U.S. The factory, as a matter of fact, maintains an ostensibly strict hands-off policy toward racing. In other words, we'll help you with parts occasionally, but don't count on it. You're on your own.

The B&S warehouse-race shop in Compton, California, is clean, realtively quiet, well lighted and organized. It does not teem with personnel. Probably all of a dozen people work there, and just a handful of them are involved in the racing program.

The racing bike spends its off-hours in a small, two-room complex in the northeast corner of the warehouse. Here it is fettled, fussed and fretted over.

With such a motorcycle you expect





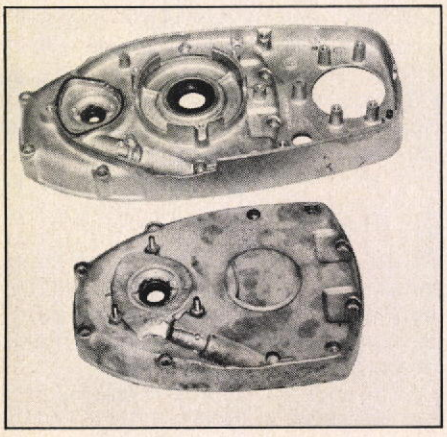
(Left) Reg Pridmore, foreground, and BMW factotum, Helmut Kern. (Right) Splayed toptubes of Rob North frame bear strong resemblance to earlier Triumph road racers. Additionally, oil cooler is Triumph unit.

WHAT MAKES REGGIE RUN!

to see radical, innovative things and mechanical exotica because, somehow, that's just the way a racing BMW should be.

Not really. The Pridmore bike is different, to be sure, but radical and exotic it's not. Rather, it appears more the result of sweaty-browed tenacity and deliberation.

The frame, for example, is a superbly crafted unit made by Rob North, a transplanted Englishman currently living in the San Diego satellite of National City. Pridmore, himself an English immigrant, was familiar with North's capabilities as a frame builder and it was largely at Reg's urging that North was given the job. The frame is very



No generator is needed on race machine, not to mention other street-going items. Thus, cover is shorn of leftovers and extensively modified.

similar in configuration to that of the briefly glorious factory BSA/ Triumph triples that Mann, Aldana, Romero, et al, rode with such distinction just a few years back. Of course, the reason the frame is so similar to those earlier Triumph units is that they too were made by North.

It is made of Chrome-molybdenum steel fashioned into a full double-cradle design. The wheelbase is a surprisingly lengthy 58 inches. The swing arm is made of large diameter tubing and appears positively gargantuan when compared to that of most other road race iron. From the overall dimensions of the frame's tubing it is easy to tell that North tolerates *no* flexure anywhere in the unit. The swing arm pivots in tapered roller bearings at each side. These bearings, by the way, are the same rollers that are used in BMW wheels, so not only are they capable of withstanding great stress but they will also weather thousands of racing miles before wearing appreciably. The issue of what to do with the driveshaft is dispatched by running it down through the hollow right half of the arm, just like in the stock BMWs.

The standard BMW driveshaft, however, runs in an oil bath from the U-joint at the gearbox output rearward. But the added weight and complication of this arrangement was deemed unnecessary for the race bike, so the joint runs exposed. The needle bearings in the U-joint require very little oil for efficient operation. Consequently, this area is manually lubed periodically with a simple oil can.

What Makes It Go?

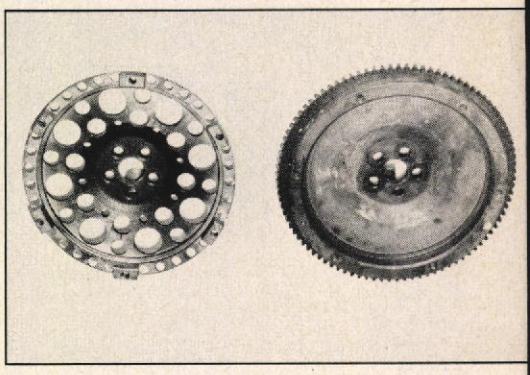
The engine of Number 63 is hardly what you'd call tricky, just straightforward engineering, mostly. Bore and stroke are stock, so displacement is 745cc. Certain detail crankshaft modifications have been made to make the unit last longer at high engine speeds. The rod journals have each been drilled to provide yet a second oil supply hole to feed the connecting rod big ends. A gnat's whisker balancing job was performed on the crankshaft after the counterweights were shaved and lightened of several ounces of steel to lessen rotating mass. No generator is used on this machine, of course, so the tapered generator drive snout on the nose of the crankshaft was removed. All bearings in the engine and transmission are standard BMW parts, although fitted to somewhat looser clearances.

Bear in mind, too, that this 9500-rpm, 90-bhp machine is predicated upon that venerable two-main bearing BMW crankshaft, a component factory engineers have designed for a maximum of 7000 rpm. Futher, the steady and deliberate Pridmore admits to having spun the engine into the 10,000-rpm range without ill effects . . . either to himself or to the engine.

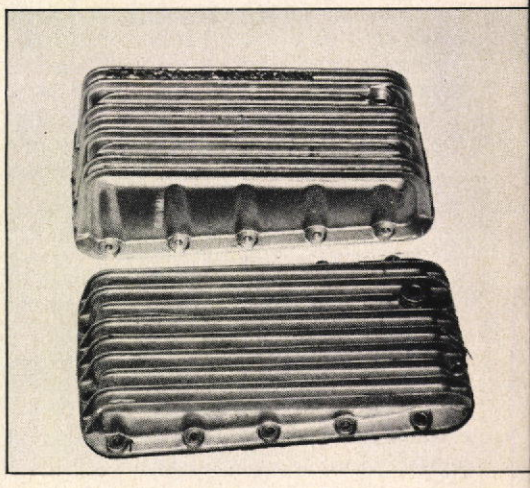
Oil pressure in the showroom stock BMW is 80-85 psi. The race bike, due to the aforementioned clearances operates at about 60 psi with excellent race track longevity. Incidentally, if revs are kept to 9000 rpm maximum, both main and connecting rod bearings will last several hundred racing miles. The BMW marque has always touted the motorcycle's magnificent reliability and low maintenance. Carrying the tradition that much further, Pridmore's racer requires absurdly low maintenance in comparison to its big bore competitors.

A stock oil pump is used, which is an Eaton-type unit capable of moving more than 300 gallons per hour. No oiling problems have been encountered and none are expected. A cast aluminum oil pan is used. A non-stock item, it carries one quart more that the standard pan's two quarts. A Triumph oil cooler is used, which boosts total oil capacity to about 3.5 quarts. Under racing conditions, the Castrol R running in the BMW's veins normally operates between 220 and 250 F.

Intake passages of the stock BMW head are angled significantly to allow for clearance between the rider's feet



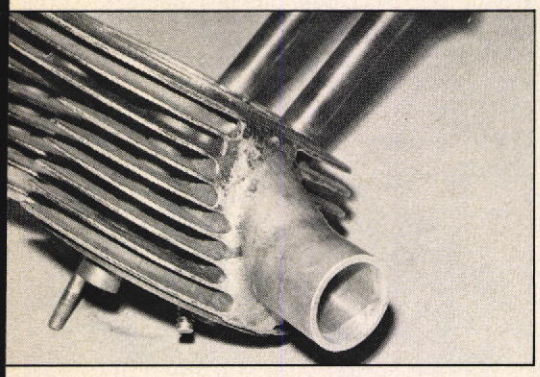
For much improved throttle response, the standard flywheel, right, is carved from its original 8 pounds down to 3½ pounds.



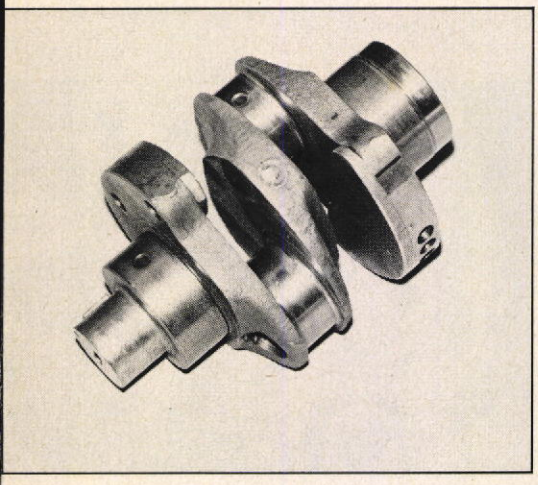
Standard oil pan, bottom, has 2-quart capacity. Racing item carries one quart more and is available from Butler & Smith.

Pistons are made by Venolia and feature altered pin location. Compression ratio is "around" 12:1.

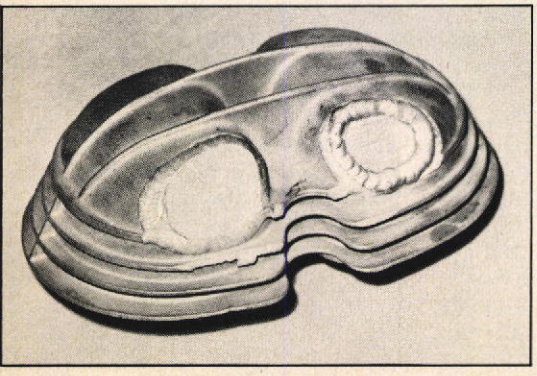
and the carburetors. Well, with *de rigueur* road race rearset footpegs this is no problem and besides, you want that intake port to have as straight a path to the combustion chamber as possible. Consequently, with a lot of cutting, heliarcing, grinding and polishing by Jerry Branch the intake ports are straighter than Prince Albert's collar stays. Too, the ducts are gloriously large, and looking through the intake hole you can see a clear path to the exhaust port. Stock intake valves are



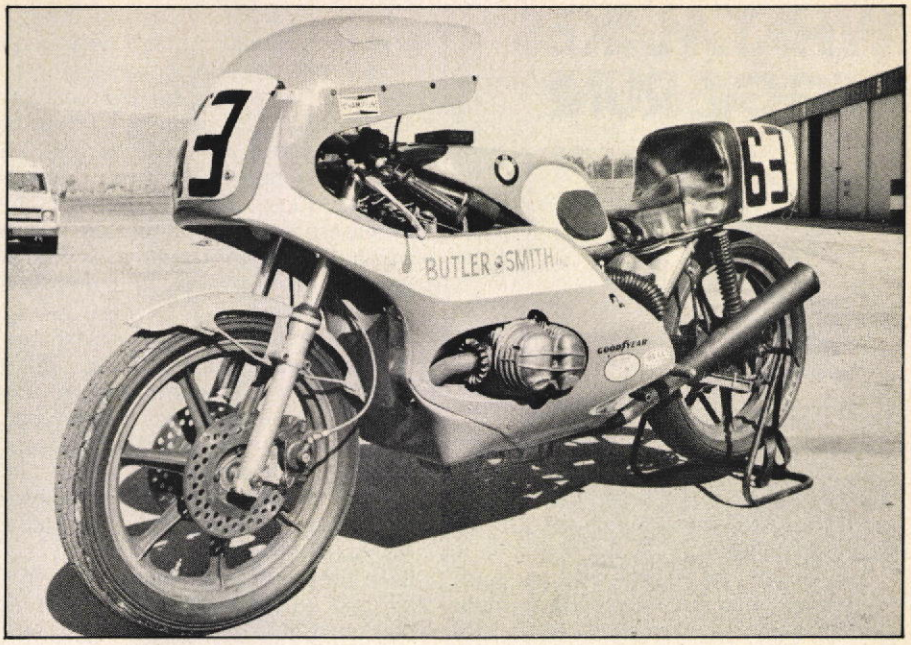
Cylinder heads are extensively modified by Jerry Branch. Most significant change is to allow intake charge straight chamber shot.

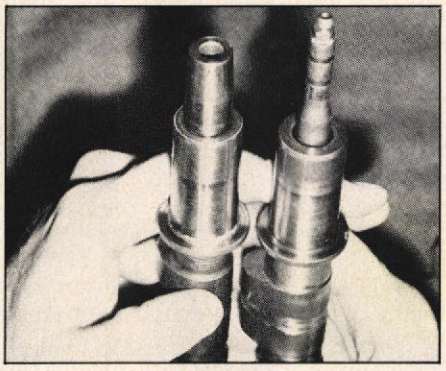


Crankshaft is basically a stock part, although it is lightened and finely balanced through shaved counterweights.



One disadvantage of opposed twin engine configuration is unfortunate tendency to grind away rocker covers when cornering.





In order to drive racing Krober ignition, standard camshaft dive snout, left, is extensively modified. Duplex chain drives cam.

42mm in diameter; the race bike uses poppets 2mm larger. Exhaust valves are stock.

Intake valve stem seals are used for that extra measure of oil control through the standard pressed-in bronze valve guides. Because the exhaust duct is not subject to the same negative pressures as the intake, no stem seals are used here.

The valve seat on the intake side is made of the same steel used in the stock powerplant. However, due to the larger valve and extensive changes in port dimension, a larger, thicker seat is used to maintain high-speed integrity.

The standard BMW crankcase, cylinder and head castings are used in the machine, and the all-important bore and stroke are identical to the showroom bikes.

The cylinder-head-to-cylinder-head span of the race bike is 28mm shorter than that of a stocker. In other words, each cylinder of the opposed twin has been shortened 14mm. This was done to achieve just a bit more clearance between pavement and rocker covers during extreme cornering lean.

B&S tech types are somewhat secretive about their engine's exact compression ratio. They will, however, admit to it being somewhere in the neighborhood of 12:1. The BMW factory has recommended that compression be kept to a maximum of 10.8:1, but this is impractical for any kind of realistic horsepower development. The pistons are made by Venolia.

The choice of a camshaft used in the motorcycle is far from final, so we can't say that the bike usesd a particular grind exclusively. Just within the past few months, though, things have finally become encouraging after a doldrum in cam development, and the motorcycle's developers are becoming quite excited. Additionally, their experience of late with camshafts and profiles has been so intense and thorough that they can now design their own grinds, thus tailoring the engine's output for specific applications. In this respect Helmut Kern and Miles Rossteucher have been working closely with camshaft manufacturer Sig Erson.

It is significant that cam development with this bike has reached a stage where their power output now exceeds that of the factory special #214 racing camshaft by 15-20 bhp!

Indeed, Reg Pridmore was elated, not to mention Kern and his staff, when at the Road Atlanta AMA National road race, Reg's motorcycle was actually out-accelerating even some of the dreaded 700 Yamahas in the circuit's uphill section. Nevertheless, development continues . . .

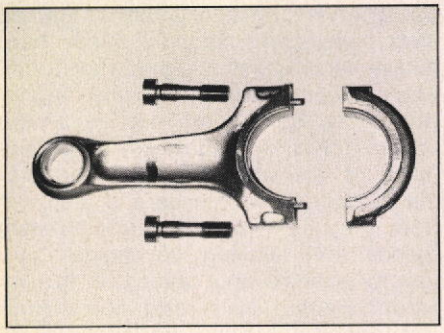
To date, the most rewarding grind has been very similar to that used in fuel-injected funny cars. Still experimenting, however, yet another grind was tried at the Ontario National last October. Results were mixed and still subject to evaluation. To boot, the camshaft broke during the first heat,

WHAT MAKES REGGIE RUN!

scratching the bike from competition. And, as this is being written, the broken components were still being scrutinized molecularly at a nearby testing laboratory to determine the exact cause of failure.

Incidentally, all camshafts used in this engine are re-grinds based upon stock bumpsticks. No special alloys are used and the basic pieces come right from the parts shelf.

Due to space limitations in the camshaft area, the BMW is firmly committed to the use of flat tappets rather than roller tappets and similar, more sophisticated valve lifting devices. To the detriment of performance, complicated mechanical laws decree that flat tappets are less than ideal lobe followers. A roller tappet cam and assembly can achieve much better acceleration and deceleration rates than can its flat



In order to withstand stresses of 9500 rpm and 85-90 horsepower, super-rugged titanium connecting rod is used. Don't ask about cost!

tappet counterpart. In this respect, the BMW engine's maximum camshaft timing is decisively limited.

Futhermore, pushrods on the racing engine have posed their own share of headaches. Just about all commercially feasible alloys have been tested. Shapes and designs have been explored, too: round, ellipsoidal. You see, the main hassle has been that of flexing at high revs. The things would show a tendency to flutter and bow in the middle and thus chafe away at the inside diameter of the pushrod tube. Neddless to say, this phenomenon wreaks havoc with performance and reliability at racing speeds. It was only after exhausting all possible shape/material combinations that it was found round cross-section chrome-molybdenum components gave the best results. Peculiarly, these items in their final configuration are quite heavy—3.5 oz. each—compared to more conventional pushrods. At least, however, they are superbly strong and flex not a smidgen. They work quite well, thank you, as attested to by the engine's 9500-rpm redline.

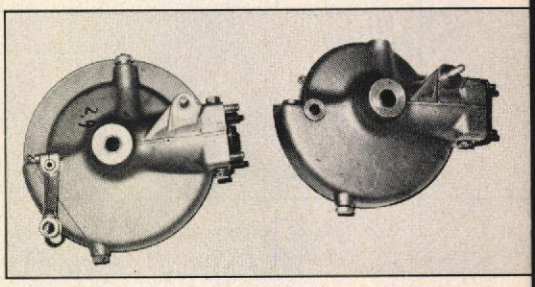
Rocker arms in the motorcycle are box stock. No modifications are done to them at all. They aren't even polished! As a matter of fact, in the past, rockers that were polished had an unfortunate propensity to breaking. As in the stock BMW, the rockers reciprocate on needle bearings. Rocker ratios have not been altered in any way because the rockers mount on the cylinder head studs. Changing the rocker ratio would also require altering extensively stud locations and attendant geometric relationships. As a result, this prospect is considered too complex and time-consuming for the amount of potential performance gain.

The valves are controlled by dual inner-outer springs working against titanium retainers. Spring pressure is 330 pounds maximum at highest lift and 120 pounds with the valve on the seat. There is a slight interference fit between inner and outer coils to effectively eliminate unwanted harmonics that disrupt efficient valve control at high speeds. Because of the ever continuing development of the motorcycle, no one brand of spring assembly is used. Norris, Erson and S&W parts can be seen on the motorcycle on just about any given race day.

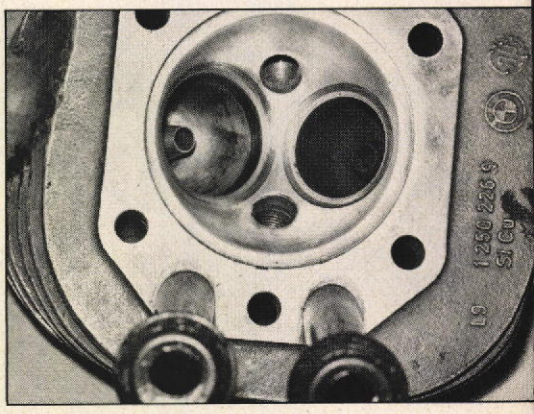
The standard BMW cam drive chain is a dual-row affair, somewhat heavy but eminently reliable. Early on in the bike's genesis it was thought that some small power gain would be realized through use of a thinner, single-row chain instead, so eliminating unnecessary rotating weight. This area was trouble-free until the engine's growing rev capabilities in turn required heavier valve springs to prevent float. As spring pressures increased, do did loads on the chain, thus inducing sprocket tooth failure . . . and it was back to the duplex chain and sprocket.

The transmission is Kaiser-converted five-speed. The thing has been in use for some time now with good results, but for the 1975 season a completely BMW unit will be used. Kaiser units were originally used when the AMA okayed the used of five-speed transmissions some time back. BMW did not have a five-speed unit of their own at the time and so they took advantage of the Kaiser gearboxes, which are actually just modified BMW components anyway. (The housing is a stock BMW part, mostly BMW cogs are used inside and a drum shifting mechanism is used instead of the stock transmission's supplied by a dual Krober unit.

The system employs two transmitters and two trigger points. Four ignition coils are used, each pair being connected in series. As you may know, the stock BMW ignition sparks both cylinders simultaneously; one piston camplates.) In terms of ratios, the most significant difference between the Kaiser conversion and the standard BMW transmissions is that the Kaiser has a slightly high low gear. In this respect, no radical adjustments are anticipated by rider or wrenches. Oh, also, like the Kaisers used now, the BMW gearboxes to be used this season will be given the Dynasurf finishing treatment, which



The shaft-driven BMW is penalized by rather high unsprung weight. Consequently, stock rear end, left, is modified for racing, right.



GP bike uses 44-mm intake valves, standard exhaust poppets. Bronze valve guides, steel seats and dual spark plugs are also used.

allows long component life without need of lengthy break-in periods.

In the clutch department, not a great deal is different here except for the extensive re-working of the flywheel to minimize rotating weight. Remember, the BMW's longitudinal crankshaft is the root of a lateral torque reaction that figures very prominently in the motorcycle's handling. The flywheel is trimmed both to sharpen throttle response and to discourage this torque reaction. The weight of a stock BMW flywheel is 8 pounds, modified it weighs but 3.5 pounds.

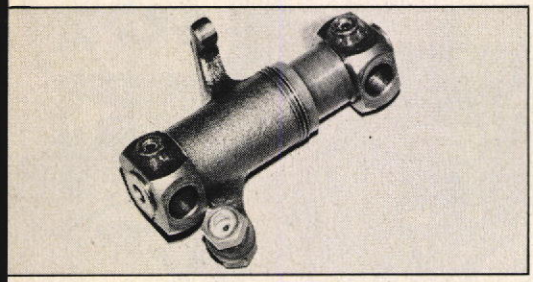
Interestingly, the racing cylinder head is fitted with two spark plugs per

cylinder, not necessarily for any whopping power increase, but to ensure the maximum in ignitive precision. Spark is just completing its compression stroke while the other is finishing exhaust.

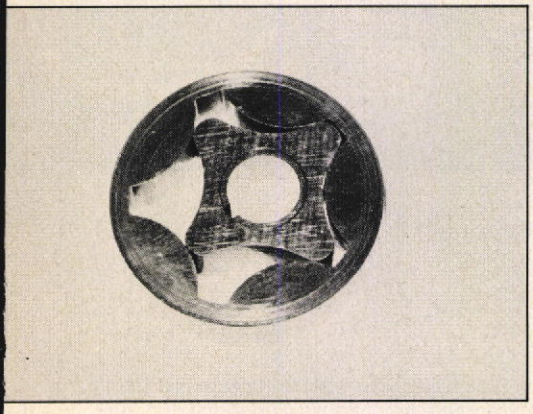
In order to drive the new ignition, which normally spins on the end of the camshaft, the stock camshaft end is removed and a new tapered drive end is installed.

Champion N-57G spark plugs are fired at precisely 34 degrees BTDC.

Carburetors used on the BMW are the ubiquitous Mikunis. While far from ideal as flow bench performers when compared to other racing carburetors, e.g. Amal GP, the Mikunis are valuable for their excellent tunability. Racing engines are characteristically very sensitive to a carburetor's transitory stages. For example, fuel metering between pilot jet control and needle jet flow, or the area spanning the upper limits of the needle's metering system and all-out main jet fuel flow can be touchy on highly tuned racers. The Mikuni allows for fine tuning control throughout these stages. Some time back a pair of 38mm units were used on the motorcycle but rider Pridmore felt that their subsequent compromising of tractability was not worth their peak rev gain. Now, 36mm Mikunis are used on the machine. Mileage with the carburetors under racing conditions is very good, about 25 mpg.



Interestingly, box-stock rocker arms are used. Butler & Smith racers discovered that polishing actually weakens rocker!

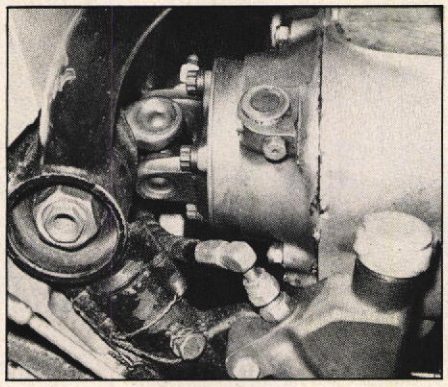


Standard Eaton-type oil pump is used. Pump capacity is 300 gph, well in excess of requirements of 60-psi system.

What Makes It Stop?

At this point in the motorcycle road race game is there any more popular braking system than front and rear discs? The fore end of the bike is fitted with a twin-disc Lockheed assembly, while a single disc is used at the back. Neither discs nor calipers float; the calipers are double-acting, which means that hydraulic pressure squeezes both sides of the disc. In contrast, the more common single-acting caliper pressurizes just one puck and, by virtue of either a floating disc or caliper, forces the opposing puck into disc contact. The double-acting system is much more suitable to racing because both caliper and disc are solidly mounted to fork and hub respectively. The double-acting system's positive hydraulic pressure on each side of the disc can often allow for greater mechanical advantage and lever feedback, too.

The discs are made of low-nickel content cast iron and are liberally drilled, not so much for lightness but for better braking in wet weather. The discs are nine inches in diameter.



Stock BMW output U-joint is enclosed. Racer uses open unit for less weight and complication. U-joint is manually lubed.

. . . and What about Bumps?

The front fork is a Ceriani unit with Betor triple clamps, basically the same as that used on the fabulous MV Agusta road racers. East Coast Racing Director at Butler & Smith, Udo Gietl, has spent 2½ years in its development and fine tuning, and much of the credit for the bike's precise steering at such twisty couses as Laguna Seca and Loudon is the reward of such efforts.

A Dunlop KR-84 tire is used on the front wheel. A Goodyear slick of A-4 compound is fitted at the rear. Granted, the combination seems somewhat odd in this age of front and rear slicks, usually of A-1 hardness compound. However, the BMW being the unconventional racer that it is, proved most unhappy at race speeds when fitted with the Goodyear slick up front; the motorcycle disconcertingly moved around causing Reg little vexation.

Rear shock absorber choice illustrates yet another one of the machine's unusual propensities. Girling double-acting (having both rebound *and* compression damping) shock absorbers, not normally available in the U.S., are used in combination with rather light 60-80-pound springs. Interesting note: it seems the dynamics of the longitudinal crankshaft and shaft drive pose certain requirements, among them heavy damping, yet gentle springing.

Contrary to what you may think, the shaft drive of the BMW is quite versatile for racing purposes. A total of eight ring-and-pinion combinations are available, ranging from a high of 2.75:1 down to 4.25:1. As an example of just how the ratios are implemented at different tracks, the lumpy, twisty Sears Point circuit calls for the 4.25:1 gearset, Laguna Seca's ups and downs require 3.56:1, 3.00:1 is used for Ontario's sweeps and straights, while Daytona necessitates the long-legged 2.75:1 gears.

The ring and pinion housing has been trimmed considerably of metal remaining from the standard drum brake provisions. The iron disc brake rotor on the rear wheel adds significantly to unsprung weight in this area, so any poundage that could be pared away will help a lot.

Cast magnesium wheels from Morris Industries are used fore and aft. Importantly, the components used here are cast to exacting Mil Specs (U.S. Gov't. Military Specifications), ensuring an absolute minimum of runout, flaws and other imperfections. No tubes are used within the tires. This is made possible by sealing the somewhat porous magnesium rim with an epoxy compound.

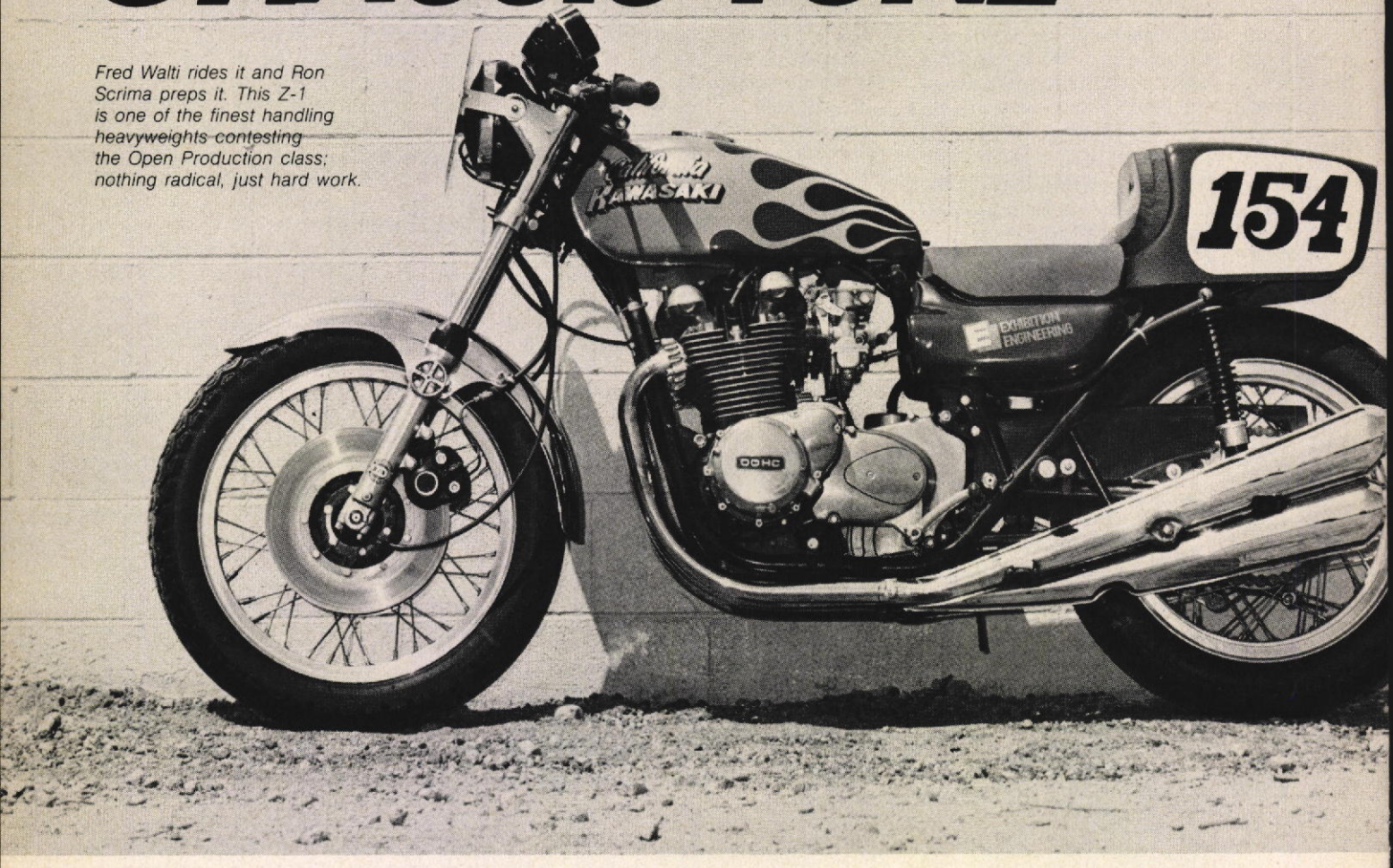
As final points of technical interest, the saddle is a Yamaha road race item, while that superbly crafted fuel tank was made by Rob North and the fairing by Butler & Smith stalwarts.

The End Result

The racing motorcycle shown here goes 165 mph, handles more like a wizard's wish than a 310-pound motorcycle and behaves in general like a BMW engineer's fantasy instead of an honest-to-Munich opposed twin. Against the arrogant, incredibly powerful two-strokes, this machine, to be frank, poses at best a modest threat to high-buck headliners around the country. But, as we said at the outset, this is not shameful to those who sweat and fret over the unique Number 63. On the contrary, it is an honorable endeavor. They've given themselves a challenge, embarking on a holy mechanical crusade, if you will, to butt heads against any and all competitors and to keep the four-stroke in the fray. And in doing so, enthusiasts everywhere are treated to seeing and hearing one of motorcycling's most fascinating racing motorcycles. •

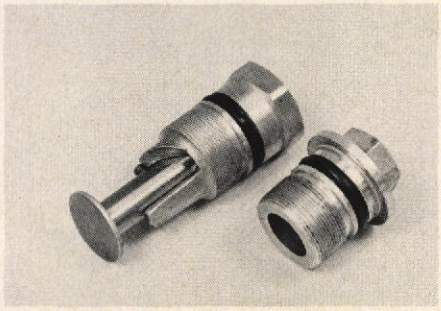
KAWASAKI Z-1 CHASSIS TUNE

Fred Walti rides it and Ron Scrima preps it. This Z-1 is one of the finest handling heavyweights contesting the Open Production class; nothing radical, just hard work.



Kawasaki's entry into the Superbike market can be turned into a winning production racer with a few not-so-simple mods.

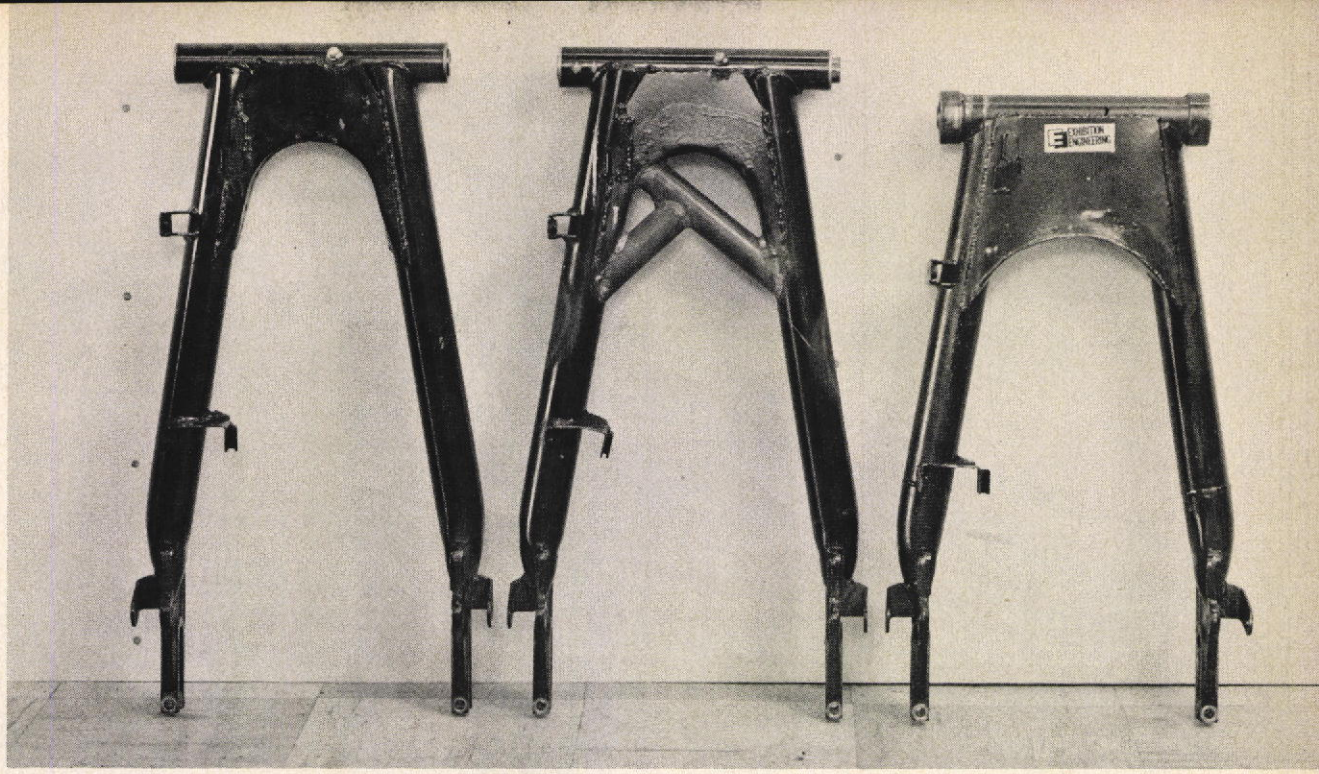
By Mike Griffin

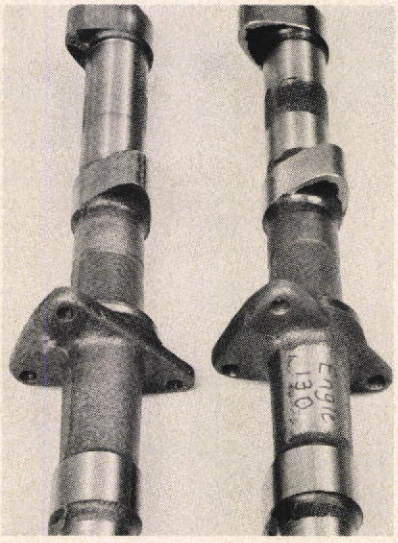


Z-1 Handling trick! By using fork top nut from F-9 Kawasaki dirt bike, left, and slightly shortening spring to fit, you will be able to adjust spring pre-load in fork leg.

There are easier things in this life than trying to make Kawasaki's fabled 900-cc *orgasmo*-bike behave acceptably in a Production Race. It's not that the thing doesn't have enough power; it has more than enough. The problem is to make the bike handle with a smoothness and predictability sufficient to put it in the winner's circle. It goes without saying that this is much easier said than done.

The Z-1, you see, although certainly adequate for about town pottering and freeway touring, is cursed with a chassis incapable of coping with the engine's awesome power and the bike's prodiguous 545-pound overall weight. Furthermore, close inspection of certain chassis construction techniques reveals more than a few undesirable traits. It is the purpose of this story to relay to you the problems encountered by motorcycle technical wizard Ron Scrima in developing the Z-1 into a viable production racer and his solutions to those problems. Some are simple, others are complicated, but if you're set upon racing this, the guttiest motorcycle of them all, you're going to have to get your hands dirty or else you won't be competitive. Getting to the finish line first is what wins races and if your motorcycle is prone to involuntary spasms and twitches along the way, your chances of winning slim

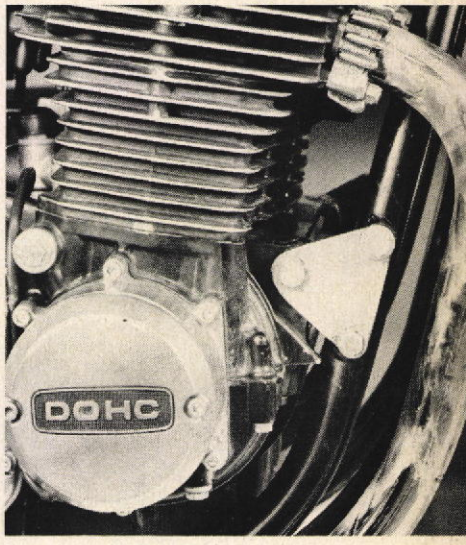




Genesis of a custom swing arm. At far left is the stock Z-1 unit. Center, modified stocker and, far right, Exhibition Engineering production arm.

Rapid Z-1 uses Engle torquer cams, right, to enhance acceleration of the heavyweight off corners.

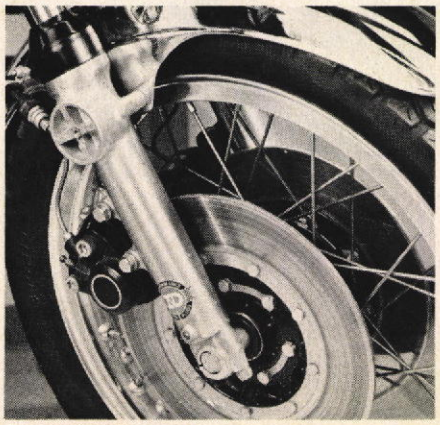
Much handling misery was traced directly to poorly fitting engine mounts, which allowed frame to distort. Scrima made new ones.



considerably. Additionally, the odds against finishing the race in the same physical state you started in swell proportionately, in this case, a matter of deep concern to this particular motorcycle's race pilot, Fred Walti; a fast man but no fool.

Let's start at the front of the bike.

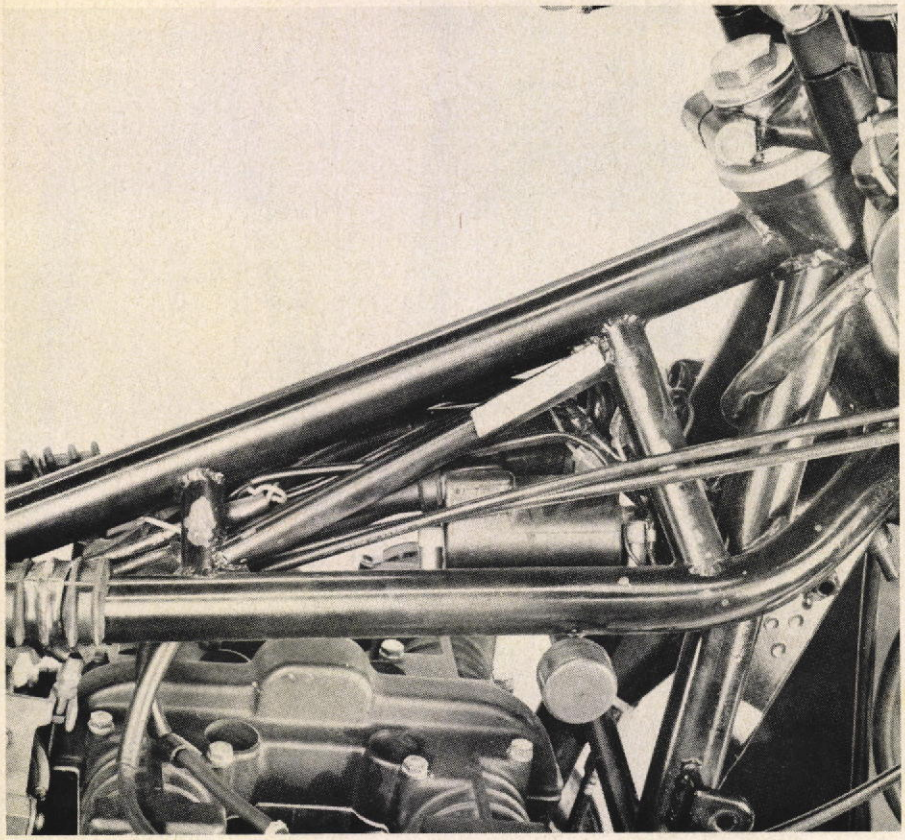
The previous owner of this Z-1 was himself a performance buff of sorts, so when the motorcycle was purchased it was already fitted with Kawasaki's optional optional dual-disc brake. The performance of this assembly is such that its use on a competition Z-1 is mandatory. The power of this stopper is astounding and when used properly allows the rider to shove the heavyweight Kawasaki much deeper into a corner than could be imagined. The parts are all available from Kawasaki directly or from most dealers and although as far as we know there is no set retail price for the kit, most dealers



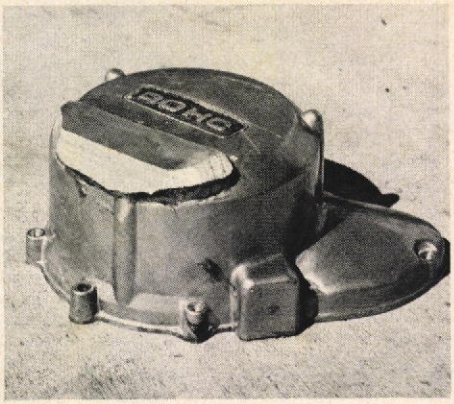
Lower fork legs were swapped side-for-side to locate calipers behind steering axis. Discs have had .100 inch milled from their surface for 2¼-pound weight saving. Custom fork oil and modified foot valves are used in forks. Spokes are 9 gauge for strength.

are charging about $115 for the whole caboodle. The kit's part number is 99990-523. All major components are included plus the hoses, pipes grommets nuts and washers needed to make this a strict bolt-on kit. The instruction booklet that comes with the kit is superbly detailed with step-by-step photos and instructions.

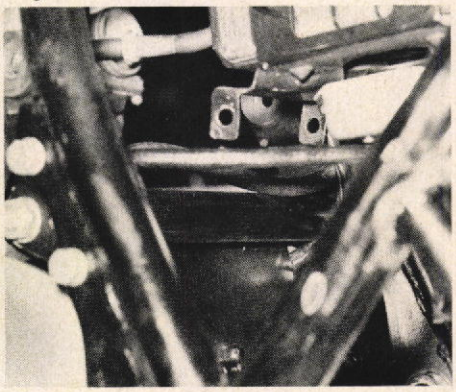
In order to reduce and relocate the brake's unsprung weight, however, the lower fork legs were swapped right for left. This enabled the brake calipers to be mounted behind the sliders instead of in front of them. The intent here is to reduce the forks' tendency to fall to the inward side of a turn, thus inducing slight oversteering imbalance. The degree of efficacy of this modification is hard to determine, Scrima says, but the idea sounds good. Also, and more importantly, each disc had .100 in. milled off. There is a lot of metal in those discs and more than enough



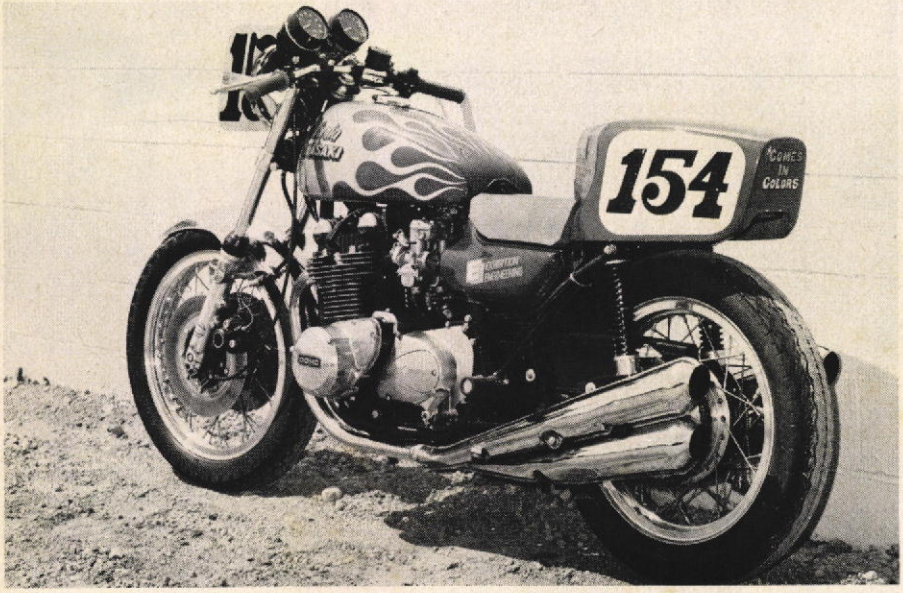
In order to provide maximum in steering head ridgidity, additional members are welded between toptubes.



Race rider Fred Walti's cornering style is evident from needed reinforcement of left engine cover.



Rear downtubes of frame cradle receive additional strength from cross-tube at center of photo. This aids stiffness in swing arm pivot area.



In AMA Production racing livery the Scrima-Walti machine appears ominous indeed. Overall weight is about 510 pounds.

heat-absorbing mass remains after the operation to leave efficiency uncompromised. However, about 2½ pounds unsprung weight were eliminated by this measure.

The front fork's high performance characteristics are something less than ideal in terms of both compression and rebound damping. Hard braking, for example, would allow the front end to dive too severely, inducing a negative trail situation. Consequently, steering would become quite dodgy. To cure this and other minor maladies the foot valve at the bottom of the fork rod was modified. The valve—actually an aluminum disc with 12 oil holes around its surface—was passing oil too rapidly on compression and rebound. As a result, damping was too weak, too easy. These holes were heliarced shut and then the disc was re-drilled with a series of smaller holes . . . simple, inexpensive and effective.

Scrima has had great success with two different kinds of fork oil. The first is a blend of his own, a concoction of about three parts ATF (automatic transmission fluid) and one part STP. ATF, as you know, is a fluid that remains very stable at high temperatures —and racing fork oils do get hot—while the STP serves to thicken the mixture to the desired consistency. Lately, though, an experimental fluid has been used with excellent results. The stuff looks like dregs from a taxi's crankcase, black and opaque. In truth, the stuff is a blend of HRL transmission lubricant and a viscosity stabilizer all stirred in with an ATF base. Walti reports that this mixture works much like the first recipe in terms of damping characteristics, yet retains those traits for a much longer periods.

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MCH2K

Scrima feels that there is more than enough metal in the steering head area to keep things from flexing at this highly stressed point. Just to be extra-safe, though, Scrima added tubular reinforcements to the frame's toptubes. No significant distortion had been encountered here in the past but it was felt that wherever the added strength would not be offset by its extra weight in stressed areas, reinforcement would be done. Additionally, below the steering head, just forward of the exhaust camshaft cover, a crosstube is welded between the frame's two downtubes. It would now seem that if the bike wiggles at all, it is surely not for lack of ridgidity in this area.

To put it politely, the Z-1's engine mounts are ridiculous. To begin with, the engine studs fit through frame mount holes clearly half again as big in diameter as the stud itself. Of course, this lets the engine move all around in the frame, tweaking things out of shape along the way. And as you twist the throttle more and the 900 puts out even more torque, the distortion becomes even greater. As a result, the original eighth-inch thick motor mounts were trashed and replaced with ones made of quarter-inch stock. Too, all that undesirable slack in the engine mount holes was eliminated. To add yet an extra degree of strength, the upper rear motor mounts were reinforced with a transverse tube running between the backtubes.

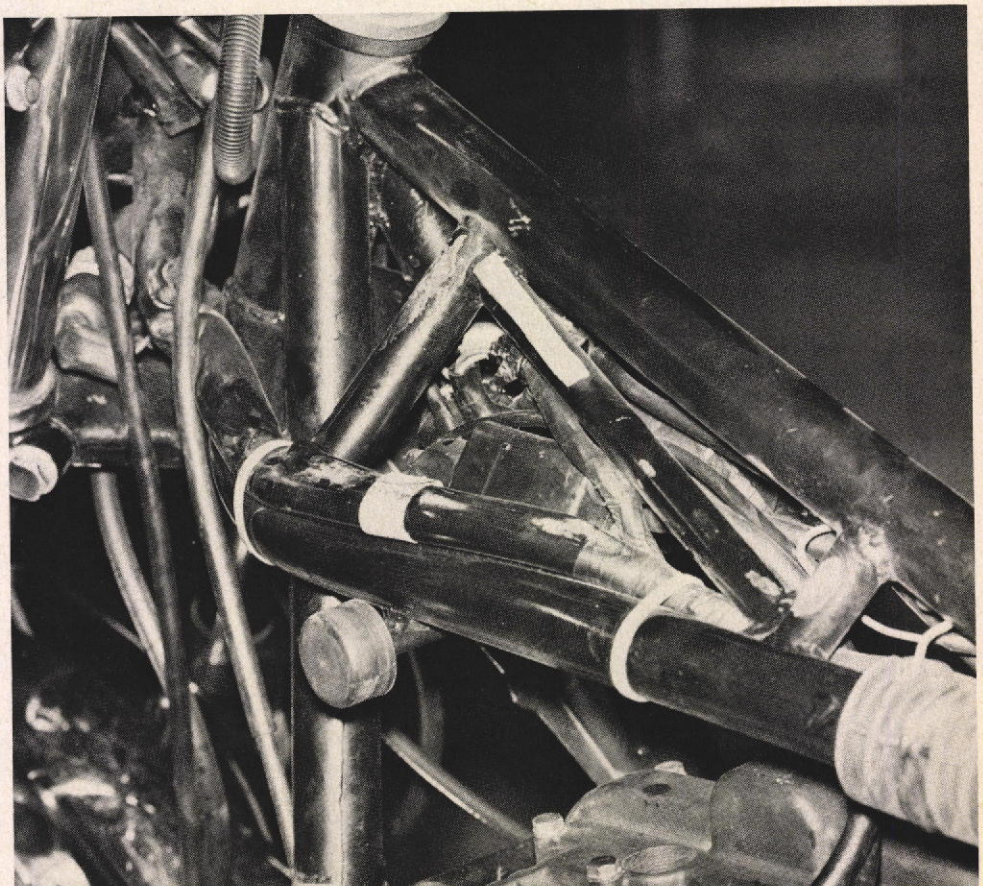
At this stage no gussetting of the swinging arm pivot is anticipated and chances are good that none will be required as development progresses. The same cannot be said for the swinging arm itself, though. It had been modified and re-modified so much that Scrima could only shrug and design a completely new one. The new one can only be described as fully one inch shorter and stiffer than hell. Also, Scrima has done away with the bushed swinging arm pivots as his own design is fitted ball bearings. Incidentally, this unit is available from Exhibition Engineering and sells for about $100 the copy. It is made of *all* chrome-moly steel, not just chrome-moly tubes with mild steel tabs or gussets, for example. Scrima's logic for shortening the swinging arm an inch is predicated upon the belief that the Z-1's wheelbase is already too long at 59 inches and lopping off that extra inch in the swinging arm does much to eliminate unwanted flexing.

According to Fred Walti, the bike's main rider, and Bob Crossman, Walti's co-pilot in long distance big-bore races, the addition of the Scrima-designed swinging arm alone is responsible for a big improvement in handling at race speeds.

Koni shock absorbers are used at the rear of the motorcycle, but Scrima and Walti admit to still being in the experimental stage here, even after several months of competition. They are well convinced of the effectiveness of the damper body but it's the spring rates they're as yet undecided about. As this is being written, 100-pound springs are fitted. However, Scrima feels that there is benefit to be had from lighter springs, say, 75 or 85 pounds. Walti weighs in the neighborhood of 130 pounds, a very significant factor in the suspension equation, and both men are intent upon scrutinizing every mechanical variable before finalizing construction.

Aluminum Borrani rims are used front and rear to replace the standard steel hoops. In his quest for stiffness in every stressed part of the Z-1's chassis, Scrima fitted stouter eight-gauge spokes to the rims. The stock pieces were actually made of ten-gauge metal tapering to nine gauge at the hubs. Because of this the wheels' resistance to distortion, particularly lateral forces encountered in high-speed turns, is vastly improved.

Several different tire combinations were tried, all with less than satisfactory results. For example, the stickiest combination—Dunlop KR 97 on the rear and KR 73 in front—actually proved to be too sticky. These tires gave so much traction that the chassis couldn't handle the stresses. Consequently, even though it had lots of traction the motorcycle would still wiggle badly enough to concern Walti considerably. Dunlop K81s are now fitted front and rear. And while the Dunlops don't offer the ultimate in racing bite, they are most predictable and slide quite smoothly; it is this sliding that relieves that extra stress from the wobble-prone chassis. Sure, it's a compromise at best but the only alternative is a completely new frame, something not encouraged under production racing tenets. After all, production racers are supposed to be pretty much stock . . .



Steering head is the most highly stressed part of any motorcycle chassis. Combine this with the fact that the Kawasaki weighs in excess of 500 pounds and produces 80 or so horsepower and triangulation becomes very important!

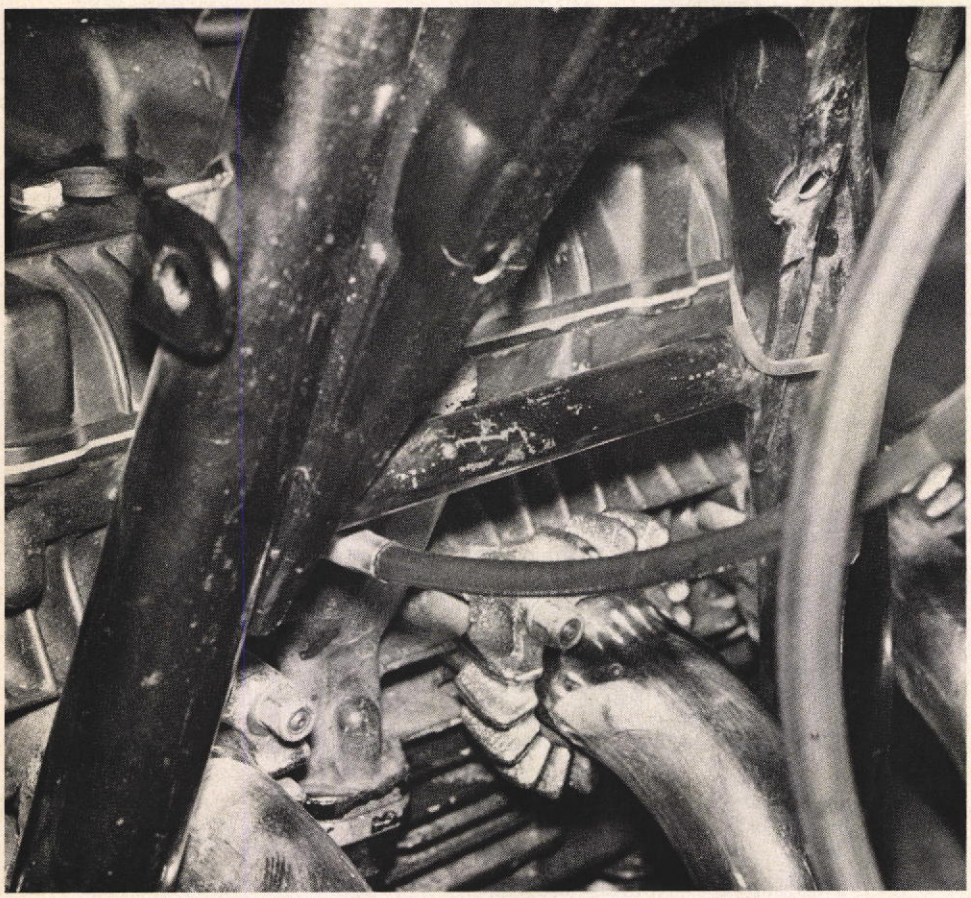
. . . which brings us to the engine. The rules governing this type racing say that engines should be stock and, in the beginning, they were, for the most. However, through a gradual yet pervasive process, the competitor with a stock powerplant now stands very little chance of being competitive. It has evolved into a "run what you brung" situation. And of course, nobody protests anybody else because they would be protested in turn, thrown out, and so on down the line. There is, however, an unofficial ethic, and this is not to be too blatant about your bike's rule stretching In other words, if you're go-

ing to cheat, don't flaunt it. After all, beating a guy in a race is one thing but rubbing his nose in defeat is another. Thus, most production racing machines try to maintain a fairly stock exterior appearance. With the exception of collector exhaust systems and a few other bits and pieces, which riders try to be tolerant of one another, and most machines do *appear* fairly stock.

In the engine compartment of Walti's motorcycle there has been surprisingly little modification . . . honest! Scrima keeps it in razor sharp tune, to be sure, but the heads remain unported, carburetors and pistons are stock, so is the ignition. The thing has not even been blueprinted, as Scrima considers the engine's design and construction to be of bulletproof quality. But to keep up with the pack, the Yoshimura-modifieds and the Action Four hotshoes, a pair of Engle experimental camshafts have been installed. Scrima used to work for Jack Engle and is more than impressed with the man's diligence and competence. Besides, Engle has had as much or more experience than any other cam grinder in designing bumpsticks for overhead camshaft machines; a lot of his work is on Indy cars. The camshafts currently in the machine are not a wild grind. Their effect helps top end power a little, but where they really have effect is in the lower rev ranges which, Walti says, gives the Z-1 vastly increased grunt off the corners, something the heavyweight really needs. Experimentation continues, though, and as new grinds are developed to maintain good top/low speed balance, they will be tried, too.

Other engine modifications are minor. The crankcase re-breather is now vented to the atmosphere rather than to the intake manifold, stock needles are used in the carburetors but are raised one notch, and 1,17.5 main jets are used and the air filter is not. Nippon Denso W 27 EM spark plugs keep the fire burning while Castrol GTX oil maintains an efficient degree of slipperiness between moving parts.

Chain life, seemingly forever a problem on superbikes, has proved to be relatively trouble-free with the addition of a Denselube unit. For racing purposes, however, you must take particular care that the master-link will not work its way loose. General Electric silicone seal is used on this machine. Monsanto 3M adhesive has been tried but was rejected because it hardens upon application, making maintenance a bugger. The silicone stuff, on the other hand, does not harden but remains a pliable, tough goo to keep things secure.



Just ahead of exhaust cam cover yet another crosstube is added to augment steering head strength. Tubing addition need not be large in diameter to help, just located in right places.

And there are also those cosmetic changes to the motorcycle; the fiberglass saddle, flashily scalloped tank, etc., that deserve mention only because they are not stock pieces. But all in all, the Z-1, while now truly competitive, is still surprisingly close to stock. The thing goes 140 miles per hour or so and handles with a modicum of safety and stability. Additionally, the engine is now more powerful and more flexible than it was at the onset of the project. In short, the bike's performance was improved at every level.

But most important, we have learned through the efforts of Walti and Scrima that the word "superbike" is just advertising puffery without hard work.

Bob Crossman's Sister Bike

Deceptively simple and Crossman swears by them; he says that these uncomplicated, easy modifications that he has implemented on his own racing Z-1 will cure most front end bothers.

Okay, so what's this magic fork trick?

Well, there's nothing really magic or tricky about it. Crossman's Kawasaki is not a brand new model. The latest ones, you see, are fitted with different dampers and springs. To our experience, the dampers offer little improvement, if any, over stock; Scrima's foot valve modifications work just fine instead, thank you. However, Crossman was intrigued by the latest Kawasaki fork spring. This unit has a slightly thicker outside diameter—about ½ mm—but fits inside the fork legs easily anyway. So what he did was fit this spring (part number 44026-042, and be sure to specify the Z-1A part) into each leg and, through use of an adjustable fork tube top nut (From Kawasaki F-9 dirt bike, part number 44041-030), Crossman could achieve a specific pre-load adjustment to the spring.

But to use the F-9 top nut Crossman discovered that the new fork spring had to be shortened considerably for them both to fit the tube, this due to the difference in length between the F-9 top nut, its small disc spacer and the Z-1 piece. Consequently, 40mm of coil were shorn from the spring. A word of emphasis: when you shorten the spring, be sure to take metal from the coil-bound area of the part and not affect the working coils.

The thesis of this modification is to provide the Z-1 with better overall springing plus an element of pre-load adjustability. The only drawback encountered with the project is interference between the top nut, which is taller than the stock piece, and some types of handlebars. Clubman bars with a pronounced droop may likely interfere while stubby Tomasellis, for example, will clear comfortably. •

BIKE BASICS

FOUR STROKES

While more mechanically complicated than the two stroke engine, the four stroke seems much easier to understand.

It's funny, peculiar. The way so many individuals interpret two-stroke and four-stroke engines is odd indeed. You see, to this scribe anyway, it seems that great numbers of motorcycle buffs will honestly admit ignorance when confronted with some of the more vexatious behavioral traits of the two-stroke engine. The things can, on occasion, mysteriously burp, spit, surge or refuse to run at all when mechanical fettlings are presumably ideal. It's as if owners expect the thing to be contrary in disposition and the two-stroke, sensing this, fulfills the expectation. And, of course, the entire episode is haplessly written off as the normal yet unexplainable jiggery-pokery attendant with two-stroke ownership.

Ah, but let a four-stroke engine start behaving erratically. At this point one

by Mike Griffin

may expect a torrent of corrective suggestions from all corners: "Have you done this?"

"Try that."

"Is your so and so correctly adjusted?" That few of these suggestions spring from sound mechanical experience and fewer still yield anything resembling encouraging results has little effect on your bouyant spirits, however, or those of anyone else. This is because 1) everybody *knows* how four-strokes work, including you and 2) being thus surrounded by a welter of earnestly helpful experts the problem, whatever it may be, will be dispatched in no time.

Why, oh why, is this so?

Well, probably because the four-stroke engine is so much more *logical*. The thing makes sense, both in principle and practice. Every time the piston strokes the cylinder, a specific, clearly defined function takes place. None of that "double-duty" razzmatazz that occurs in the two-stroke. At just about any given point in the four-stroke's operating cycle the engine is either intaking, compressing, combusting or exhausting. These stroke's, furthermore, can be perceived individually or as a whole. In other words, to grasp the workings of the two-stroke you have to keep track of at least two functions happening in the engine at a particular time, e.g. combustion chamber charge compression occurs simultaneously with crankcase charge intake. With a four-stroke, well, it's pretty much one step at a time.

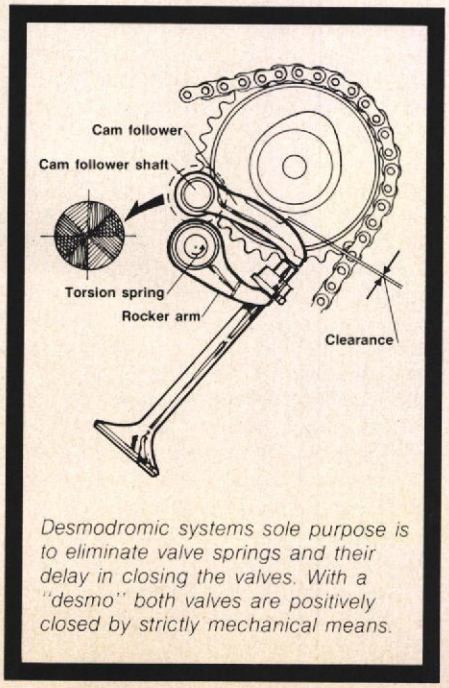
Popularly, the man given credit for the four-stroke's invention by today's motorjournalists is Nikolaus August Otto. In truth, though, the basic four-stroke theory was first formulated and publicly expounded by a Parisian contemporary of Otto's, Beau de Rochas. In 1862 de Rochas laid down the four essential conditions for the husbanding of internal combustive energy: 1) Maximum cylinder volume with a minimum of cooling surface. 2) A maximum rapidity of expansion. 3) A maximum ratio of expansion. 4) A maximum initial pressure of the ignited charge.

Furthermore, de Rochas suggested that these conditions can be best realized through adoption of the following sequence: 1) Suction of a combustible mixture on the piston's first "outstroke." 2) Compression of the mixture during the following "instroke." 3) Ignition of the compressed charge at TDC and the subsequent expansion of the exploded gases at the next outstroke. 4) Expulsion of the burnt and expanded gases during the next instroke.

But if Otto is to be denied credit for first devising the four-stroke's fundamental theory, he must surely be praised for developing the first workable system of mechanical valving for the beast. He's the guy who made it work, who made it a banging, fuming metal reality.

In our explanation of how the four-stroke works you must bear in mind that the whole thing is predicated upon two shafts: the crankshaft and the camshaft. It is also crucial to today's lesson that you grasp the four-stroke's 720-degree start-to-finish cycle. In other words, the four-stroke's crankshaft revolves fully twice to yield one complete cycle, as opposed to the mechanically simpler two-stroke, which needs but 360 crankshaft degrees to do the same thing.

The aforementioned camshaft is basically a metal stick with bumps on it. This stick turns at one-half crankshaft speed, commonly driven by chain/sprockets or gears. It is the function of this lumpy shaft to open the valves at appropriate moments. For sake of simplicity, let's make our engine a single overhead cam design. With the cam in the head like this, we sidestep the complications attendant with the push-rods, tappets and such used in the more common overhead valve configuration. Little levers, called rockers, transfer the bumping motion from the cam to the valves. One end of the rocker rides on the camshaft and the other is in continual contact with the end of the valve. It pivots in the middle, like a tiny see-saw. Thus, when you spin the camshaft, its bumps actuate the levers and open and close the valves. More accurately, springs bearing on each valve do the valve closing with, of course, permission from the camshaft bumps.



Desmodromic systems sole purpose is to eliminate valve springs and their delay in closing the valves. With a "desmo" both valves are positively closed by strictly mechanical means.

Okay, with these basics in mind, let's follow a four-stroke engine through its cycle. We'll begin with the piston at top dead center, or TDC. The piston is beginning its downstroke, so as it rolls past TDC the time is opportune to open the intake valve. Thus, as the piston continues its downward trek, it pulls fresh fuel/air charge through the open intake duct into the cylinder.

At the piston's lowest point in the cylinder—bottom dead center, or BDC—we'll close the intake valve. This accounts for 180 degrees of the 720-degree life cycle so far. Now, with the cylinder full of explosive charge and both valves closed, the piston starts back up the cylinder, compressing the charge in the process. During this time another 180 degrees go by and the piston is again at TDC. The compressed charge is now ignited. Things go boom, naturally, and the rapidly expanding gases force the piston downward again. This is the work stroke of the four-stroke engine . . . and there go 180 degrees more. The piston is found at BDC after this and the cylinder is full of spent, useless gases that must be eliminated. Remember that as the crankshaft has been going through these motions its energies have also been spinning the camshaft. As a consequence, the exhaust valve is bumped open. In this way, the now ascending piston can force spent gases from the cylinder. Having completed this exhausting stroke the final 180° of crankshaft cycle are used up and we are back where we started.

Simple, huh?

Well, yes, at least in this rudimental performance. However, there are subtleties and complications that appear. To begin with, it takes time to open valves. They don't pop open wondrously and instantaneously. As valves are possessed of mass, physical laws dictate that they must be *accelerated* to maximum opening. The incoming fuel/air charge also has mass that must be dealt with and this, too, must be accelerated. So, to handle these contingencies, let's start opening the valve somewhat before TDC, say about 30 degrees BTDC. In this way, the intake valve is opened appreciably by the time the piston attains TDC. It is also important to mention at this point that giving the valve a headstart over the

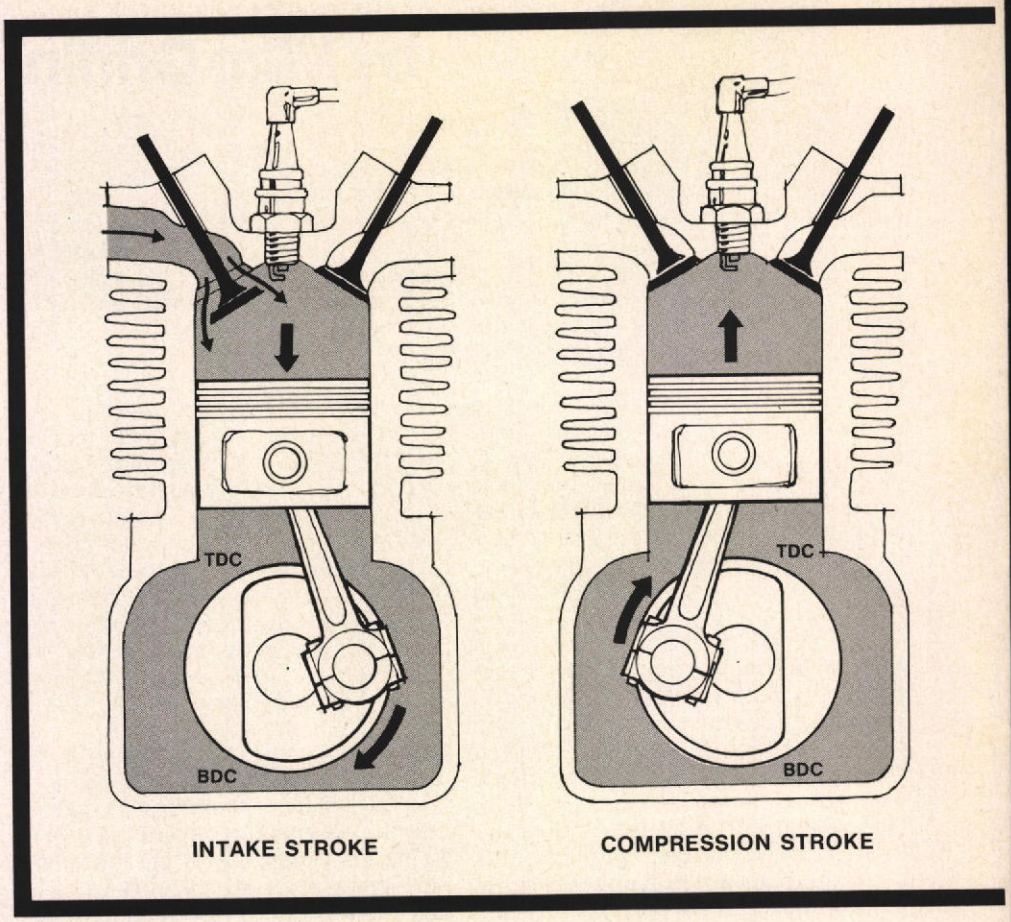
piston stroke like this has very little adverse effect on air flow, so the passage of the fresh charge is relatively unimpeded down the intake port to the cylinder. By the time the piston reaches about half its maximum downward speed on the intake stroke, approximately 30 degrees after TDC, the charge just begins to move in the intake port—remember what we said about accelerating mass?—and is nowhere near half its maximum speed. Generally speaking, maximum charge speed occurs when the piston is around 75 degrees before BDC.

Because we now have that moving charge in the port and cylinder, another phenomenon is encountered: inertia. Physical laws also say that a moving thing with weight tends to stay moving, and this intake charge is no exception. As a matter of fact, its momentum is such that we can afford to keep the intake valve open past BDC and realize a net gain despite the piston's upward travel. And besides, we have to decelerate the valve. This, too, takes time. As a result, we can close the intake valve at about 60 degrees after BDC.

Because the fuel/air explosion also requires a certain amount of time, it is necessary to ignite this somewhat sooner than you'd think. Commonly, ignition can take place in modern engines anywhere between 20 degrees BTDC for milder engines to almost 50 degrees BTDC in radically cammed nitro burners.

Interestingly, utilizing advanced spark ignition means that combustion will actually be pretty well dissipated long before the piston progresses to BDC. Indeed, our supposedly typical engine likes having its exhaust valve actuated around 60 BBDC. And that's not all, for it prefers to have that valve hang open all the way up *past* the piston's TDC mark. If you've been following this mechanical vignette closely, you're probably musing, "Why that means that now the intake and exhaust valves are open at the same time." You're right. They are. This is called overlap, and this is described in degrees of crankshaft rotation. In this specific case, with the intake opening 30 BTDC and the exhaust closing 30 ATDC, total overlap is 60 degrees.

Overlap is used in four-stroke engines to take advantage of the inertia of both intake and exhaust charges. You see, with the intake mixture rushing into the cylinder from its own momentum, it has a tendency to keep right on going out the open exhaust port. As a matter of fact, some of the intake charge would be quickly wasted out the exhaust port were it not for the spent exhaust gases already on their way out. So, what happens is that the incoming intake charge helps push the exhaust gases out the cylinder. Okay, now brace yourself because here comes inertia again, for once the exhaust has achieved sufficient momentum through the port, it actually pulls some of the intake charge along, too. So the effect of scavenging the cylinder of waste gases is the result of first, exhaust gas momentum, and then intake charge momentum.



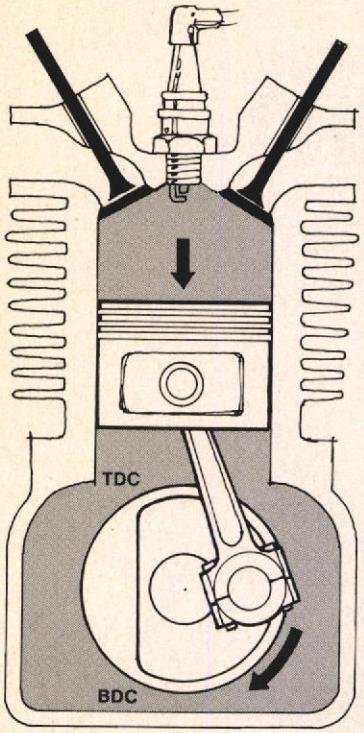
In racing engines with radical camshaft timing, valve overlap tends to be extreme for good high speed scavenging. However, lots of overlap tends to be wasteful with fuel, often pumping much of the intake charge out the exhaust. One method of minimizing this effect is the use of the megaphone exhaust pipe. What this does is set up a standing shock wave within a given rpm range. The shock wave would "tune in" at the port and act as a barrier against further charge loss. Another high speed tuning approach is designing the exhaust pipe to yield a wave of negative pressure traveling back to the valve. If this wave arrives at the valve at the right time—at or near TDC—it will accentuate the scavenging effect. Additionally, some decades ago it was discovered that adding a reverse cone to the open megaphone end would be helpful in spreading these beneficial effects more equitably through the power range. Nevertheless, the highly tuned four-stroke, single-cylinder road racers of the past, the Velocette, Norton Manx and G50 Matchless were most sensitive to exhaust tract tuning, in many cases more so than to intake tuning!

Even though this mechanical ritual may be repeated several thousand times in one minute, it is important to bear in mind that of the engine's total 720-degree cycle only about 120 degrees are directly spent in producing power. All the rest of the crankshaft's motion is spent pumping in fresh charges, compressing them and pumping out spent gases.

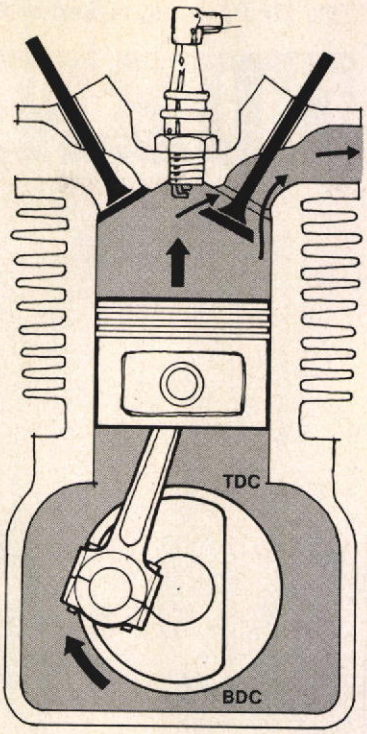
Viewed in this light, the fact that the normally aspirated four-stroke is capable of more than three bhp per cu. in. displacement on gasoline is truly astounding.

We based our conversation thus far upon the overhead camshaft method of valve actuation. What we have neglected is the pushrod overhead valve and the L-head, otherwise known as the flathead or sidevalve.

The overhead valve system implements a camshaft, a cam follower, a pushrod, a rocker arm and finally the valve. Even though comparitively heavy in terms of reciprocative weight, some pushrod engines can be made to run in excess of 11,000 rpm with reliability. On the other hand, the design of pushrod camshaft profiles can be tricky to say the least. The tappets and pushrods must be accelerated and decelerated with reasonable precision, spring pressures are crucial and, in general, the system is subject to failure from



POWER STROKE



EXHAUST STROKE

many complicated and undesirable harmonics occurring at various speeds when pushed to the limit.

As a rule, the pushrod OHV approach is suitable for low-to-moderate moderate rpm applications. For motorcycling's purposes, about 9000 rpm should be viewed as the upper limit for large displacement machines.

The L-head engine probably reached its highest stage of development in 1969, as exemplified by the fabulous KR-series Harley-Davidson racers. Although no longer considered competitive, the engine's output of 58 bhp is still considered close to unreal for a flathead powerplant. Additionally, road racers powered by this engine were capable of an honest 150 mph!

In the L-head engine, the faces of the valves are on the same plane as the cylinder deck. The combustion chamber is in the head but intake and exhaust ports run through the engine block. The main benefits of this arrangement lie in simplicity—camshafts *under* the valves often bearing directly on them—and economy. The disadvantages are in engine breathing, for it is most difficult to balance high compression ratio with valve shrouding in the combustion chamber and realize high power output.

In our sample engine we used the example of the single overhead camshaft layout. One step closer to the ultimate in performance is the dual overhead camshaft system. The DOHC arrangement is good in that it can dispense with rocker arms entirely and use a dead minimum of valve actuating machinery. In the Z-1 Kawasaki, for example, the cam lobes bear upon shims which in turn bear on the valves. Reciprocating weight is minimized in the valve train. Additionally, because acceleration and deceleration ramps for tappets and pushrods are unnecessary to the cam profile, the lobes can be ground with timing much more agreeable in terms of overall engine performance. As a performer, the DOHC engine can be made capable of almost astronomical rpm. A GP Honda of a few years ago comes to mind that would spin past 22,000 rpm!

While the camshaft is clearly heart of the four-stroke engine, the poppet valve is then its eyes, ears, nose and throat. The poppet is indispensable yet often ignored. And even when attention is paid to it, the poppet is usually misinterpreted and misunderstood. The valves exist in a decidedly hostile environment, particularly the exhaust valve. A maximum of heat, a minimum of lubrication and incessant pounding all gang up on the poor poppet in a malicious mechanical conspiracy. For example, during full throttle operation, the exhaust valve may well glow cherry-red, with temperatures exceeding 1200 degrees F. Unfortunately, extreme heat has a way of nose-diving tensile strength, and it is sad indeed that the engineering behind valves goes much unappreciated. Valve cooling has always been a problem and the exhaust gets the worst of things. The intake unit at least gets the benefit of a cooling intake charge now and then, but the exhaust valve can only transfer heat away through its valve guide or to its seat when it is at rest. As a matter of fact, most of an exhaust valve's heat is transferred to the cylinder head via the valve seat. Only a small part of the heat is transferred through the guide.

In this respect alone the importance of correct valve clearances becomes paramount. When the engine becomes so hot that the valve's heat growth overcomes lash in its train, the valve will no longer seat. Consequently, there is no way to dissipate its heat, so its seating edges begin to burn away. Unfortunate, yet avoidable with just routine maintenance.

Proper guide fit and seating are crucial considerations in valve system design. The valve seat should be wide enough to absorb the continual pounding of valve movement,. It should also be wide enough for good contact and heat transfer. However, it should not be so wide as to impede flow past the valve. As a rule, seat width is somewhere between .060 and .075 in. for the intake and .080 and .100 for exhaust.

As a matter of necessity, valve material is characteristically high-alloy steel. Compounds with manganese, chrome and nickel content of 30 percent or more (also known as austenitic steels) are used most often. Austenitic steels are valuable for this because they offer excellent resistance to oxidation at high temperatures and maintain high tensile strength in these heat ranges.

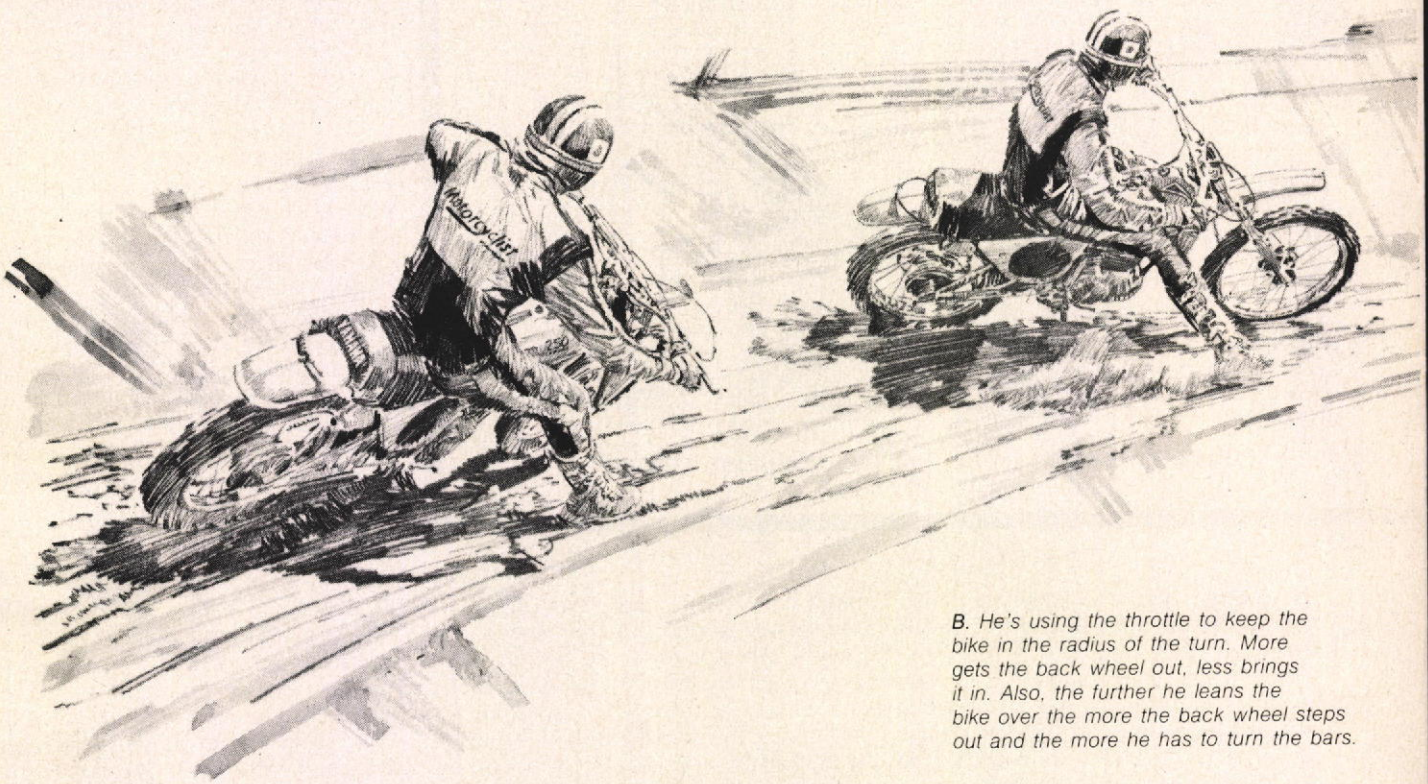
Lack of space prevents us from a deeper discussion of four-strokery, and Lord knows, there's a lot to be said. Valve springs, for example, and harmonics, various profiles, materials and production procedures, the list goes on. Also, throughout the years there have been countless interesting departures from the original theories of de Rochas and Otto, some that worked and many that didn't. But the field is vast, too vast to be described in these humble pages.

But rather than frustrate with what we can't describe, our sole intent has been to inform those among us unfamiliar with what makes our motorcycles go. In light of what de Rochas and Otto have done, it is the least we can do.

In other words, although the intake stroke takes place in 180 degrees of crankshaft rotation, it is the nature of air flow and physics that the intake valve be open for about 270 degrees of crankshaft rotation. •

HOW TO RIDE TURNING

Text By Dave Ekins-Senior Editor



A. The rider is almost sitting on his gas tank. He's got the back end out by using the rear brake upon entering the corner. His foot is out for assurance, just gliding along the track.

B. He's using the throttle to keep the bike in the radius of the turn. More gets the back wheel out, less brings it in. Also, the further he leans the bike over the more the back wheel steps out and the more he has to turn the bars.

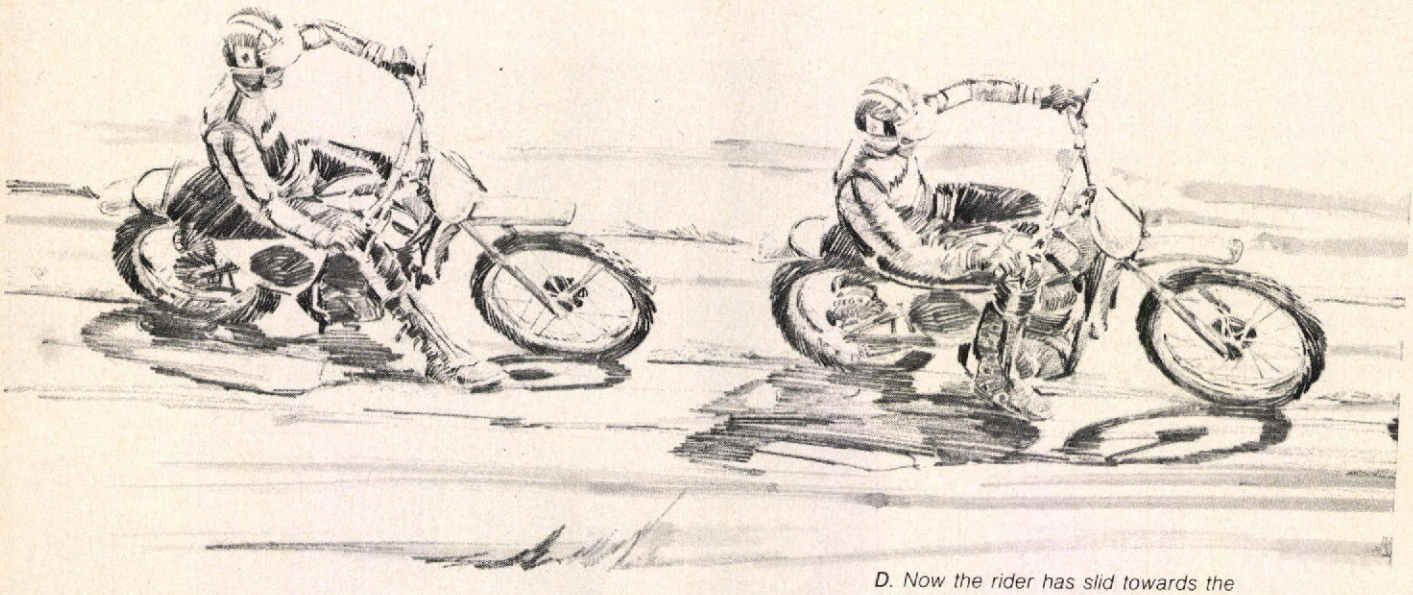
Motorcycles are fun because you lean to turn. You can do a whole bunch of other things but the basic turn is your first experience. In fact, you do it so often and so many times during a ride that one rarely considers if he is doing it properly. Or is there really a proper way to turn?

Some say to turn as if you are a part of the bike, your torso in the same line as the rear tire. Others tend to remain vertical while they lean the bike beneath them, and there are those who lean inward and leave the bike straight up. These are all proper, or all improper. It doesn't really matter as long as the bike gets through the turn .

Even more variations on the technique of turning are found in the dirt. Dirt's really a lot more fun than the street because the tires lose their grip and skate a while before what you're doing causes the bike to wash out completely. If you do kiss the ground, it's usually soft enough not to hurt.

There's actually a whole lot more to riding a turn than we can cover here. Let's take into consideration your basic under-powered motorcycle and look at a turn that's just perfect for second gear. There're no banks or shoulders in it, just a flat gravely thing. The straight gets you going really fast in third, so you've got to brake before back-shifting into second.

In a straight line the front brake will stop you in half the distance of the rear one. Reducing speed quickly means application of the front brake as



C. Here he brings the rear wheel under the bike simply by rolling the throttle back, but not totally off. As the bike gets straight it's best to find the footrest with the inside boot.

D. Now the rider has slid towards the back of the seat for traction as he accelerates down the straight. Too much too soon and he'll get into a wheelie.

well as the rear, always in a straight line. If you've got it bent over and grab the front brake you'll most likely fall.

If the front locks up in a straight line, this will also dump you. Apply pressure to the lever so the forks collapse; but try to "feel" it, so the tires keep their bite. Shift it back into second as you get off the front brake. Lean it into the turn, allowing the drag of the rear brake to step the back tire out, then get on the power.

The back wheel is driving the bike toward the inside of the turn while the front tire is pointed to the outside. A combination of body lean, throttle and steering hold the bike in an arc around the turn. Your foot is out there to help maintain balance, like a third point. If done perfectly, you needn't take your foot from the footrest.

We all slide to the front of the seat when cornering. This gives the front tire more bite and allows the rear less. When the end of the turn is in sight, slide back on the seat. The bike almost straightens itself up. Accelerate to the next turn.

Familiarity with the bike is the most important thing, practice next. The two go hand-in-hand. Probably the best way to learn is to find a flat area and start riding figure-eights. Begin in first gear, making the circles tighter and tighter. Now, try second, third and so forth. I even know a guy who got so hooked on figure-eights that he wore out a motorbike doing them. He never did learn to jump. •

FINAL ALL STAR BALLOT

They're coming down to the wire in Motorcyclist's battle of the champions; you can still throw a blanket over the leaders!

The ballot on the facing page marks the last chance you'll have to put "that guy" out front on the victory lap, on stage at the Daytona Awards Banquet this March 7. He's lookin' good but he still doesn't have it wired because of the intensified competition in this second annual All-Star Awards program.

The stage is set, the awards are confirmed, and it only remains for the ballots to close and be tallied. January 31 has been established as the closing date for all ballots, so mark them up and speed them in. Let's get this show on the road!

It's a big night for the winners when, at the height of Daytona Speedweek, they are feted with a banquet at the Americano Hotel attended by several hundred motorcyclists from all walks of industry and sport, professionally entertained and, finally, accompanied to the stage by waves of applause from their friends and guests. It may only happen once in a lifetime. They're all great bikers, for their performance has proven that, but even the most track-hardened pro is overwhelmed with an innocent flush of excitement when he realizes that you have singled him out as your personal idol in his particular sphere of competition. Only you can make it happen, with the help of the Awards sponsors included here.

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MARK YOUR BALLOT, REMOVE THIS ENTIRE PAGE AND MAIL IT IN ENVELOPE ADDRESSED TO: MOTORCYCLIST MAGAZINE, ALL-STAR BALLOT 8490 SUNSET BLVD. LOS ANGELES, CA 90069

DIRT TRACK TUNERS

- ☐ Jack Hateley (John Hateley)
- ☐ Mert Lawwill (Mert Lawwill)
- ☐ Bart Markel (Corky Keener)
- ☐ John Miller (Chuck Palmgren)
- ☐ Doug Schwerma (Honda)
- ☐ Brent Thompson (Mike Kidd)
- ☐ Shell Thuett (Yamaha Team)
- ☐ Bill Werner (Gary Scott)
- ☐ Ron Woods (Rob Morrison)
- ☐ _____

ROAD RACE TUNER

- ☐ Ken Bailey (Paul Smart)
- ☐ Kevin Cameron (Jim Evans)
- ☐ Kel Carruthers (Yamaha Team)
- ☐ Nick Deliganis (Gary Scott 250)
- ☐ Mel Dinesen (Steve McLaughlin)
- ☐ Randy Hall (Yvon DuHamel)
- ☐ Erv Kanemoto (Gary Nixon)
- ☐ George Vukmanovich (Hurley Wilvert)
- ☐ Bill Werner (Gary Scott 750)
- ☐ _____

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- ☐ Don Jones (Gary Jones)
- ☐ Jim Felt (Jim Weinert)
- ☐ Skip Kreps (Kenny Zahrt)
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- ☐ Tom Volin (Mike Hartwig)
- ☐ Steve "Porky" Whitelock (Rex Staten)
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- ☐ _____

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- ☐ Steve Eason
- ☐ Steve Eko
- ☐ Tom Norris
- ☐ William Purvis
- ☐ Leroy Roper
- ☐ Phil Roper
- ☐ Mark Smith
- ☐ Gary Sugg
- ☐ _____

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- ☐ Bruce Hanlon
- ☐ Guy McClure
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- ☐ Greg Sassaman
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- ☐ Mert Lawwill
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- ☐ Gary Scott
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- ☐ Kent Andersson
- ☐ Gianfranco Bonera
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- ☐ Taks Katayama
- ☐ Teppi Lansivouri
- ☐ Phil Read
- ☐ Barry Sheene
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- ☐ Gary Bleil
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- ☐ Dick Burleson
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- ☐ Bill Kain
- ☐ Dave Latham
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- ☐ Malcolm Smith
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- ☐ Skip Aksland
- ☐ Cliff Guild Jr.
- ☐ Bruce Hammer
- ☐ Murray Hoffman
- ☐ Dennis Phelan
- ☐ Dave Roper
- ☐ Richard Schlachter
- ☐ Dale Singleton
- ☐ John Volkman
- ☐ _____

DRAG RACE RIDER

- ☐ Mike Bruso
- ☐ Dave Campos
- ☐ T.C. Christenson
- ☐ Marv Jorgenson
- ☐ Bob Mauriello
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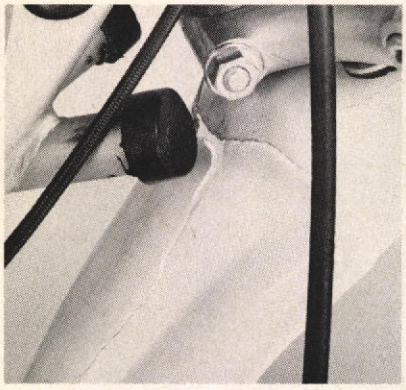
A TALE OF TWO PENTONS

continued from page 53

next time the machine was ridden it became painfully clear that they were no longer working and would have to be replaced. We chose a set of Telescos and have since put over 500 similar off-road miles on them without the slightest hint of them wearing out. Why the Konis gave up is a mystery. It might have been those early miles with too soft a spring. We don't know.

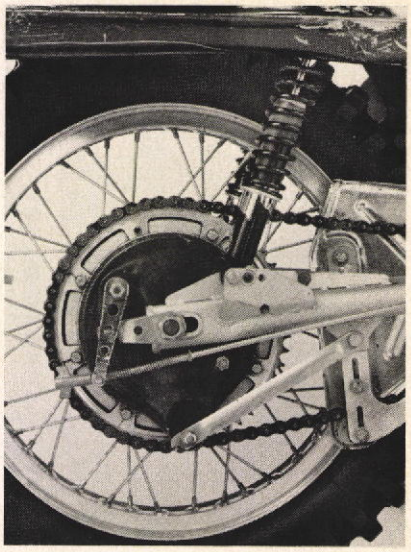


Both machines seemed to have rather delicate fenders. Rather than break, they seemed prone to crack. We lost the front one on the 250 and the rear one on the 125. Both from crashing.

Once you've completed Greenhorn with any machine your confidence in that machine doubles. The 250 had fouled a few plugs but otherwise never missed a beat. The 125 ran faultlessly throughout the entire run and was, in fact, the only machine on our minute to run completely trouble-free. To its credit it was also the smallest machine and therefore had to work somewhat harder all the time. Both machines shed their stick-on Penton/tank decals before the end of the first day and, while annoying, that can hardly be called a functional fault. Both wound up with scratches here and gouges there, but none that had any effect other than appearance. By the end of Greenhorn we both felt that we'd be more than satified if we'd purchased the machines just for the one event.

Truthfully, the beating that they both took during those two days told us more about the machines than all of the other riding put together. It was not until the event following the 500-miler that the chains finally required adjustment. Both had over 800 miles without any attention other than lubrication. However, it was time for new rear tires.

At this writing the machines are still with us, still in regular use as enduro mounts. Due to a couple more serious endos, the 125 appears shabbier but is in just as good a shape as the 250. Eventually they'll be sold but the new owners will probably not believe what we tell them. It sounds too much like a salespitch. •



Stock Konis went away, were replaced by Telescos. Chain went over 500 miles before adjustment but guard split after about 300. Sprocket lost one bolt and rear tire lasted 1200.

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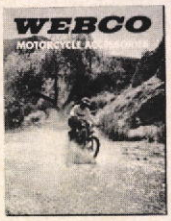

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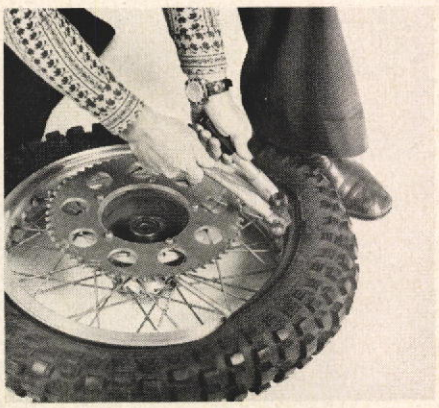
TIRE CHANGING MADE EASY

There's no job that can be easier, or more frustrating, than changing a tire. Improperly used, tire irons can pinch tubes, scratch rims and turn knuckles into a bleeding mess. We recently tried the new Breezer, distributed through Rojen B in Van Nuys, Cal., and must admit that it added another dimension to tire changing. You beat the tire off. ●

Once the tire bead has been lifted over the rim, the Tire Breezer is dropped between the bead and the rim.



Once in place, the ordinary tire iron is used to hold the bead. A hammer moves the Breezer around rim.

The farther you go the easier it gets. By half-way around the Breezer can be pushed the rest of the way.

BULTACO 350 ALPINA

continued from page 47

It comes pretty well set up for enduros. Rubber covers around the two hand levers and full protection to the throttle cable indicate this bike could wallow in the mud with the best of 'em. It's certainly got the kind of power to get you out of those slimy spots, and should *crawl* up a greasy hillside as well. The tenth-resettable Veglia-Bressel speedometer will give you an accurate account of the miles you've slithered.

They've done a nice job with the air filter too. Hidden under an orange cover of the orange and blue color scheme, is a genuine Twin Air foam pad. Its well sealed and requires incoming air to rush in from under the seat, a feature that makes the new Alp particularly well suited for splashing about in streams and shallow pools.

Wide, deeply valanced fenders will keep the junk off you, even the mud flap up front helps. The aluminum front fender is held by three new huge-head screws that grunch in the tire tread when you bottom the forks. And the springs are so soft it's not difficult to do. A couple Bultaco fork spring spacers should have been factory fitted.

The rear fender is stainless steel and mounts the rubber bracket to which the large taillight is screwed. This practice of rubber mounting the lights, including the headlight, doesn't make a whole lot of sense to me. I had to ride the Alp after dark out in the boonies and that wiggly headlight never stayed in one place long enough to spot anything.

The new side stand position is worth mentioning; it's on the swing arm like the new Sherpa Ts. It's got a new right-side engine case and the cross between a Matador and Sherpa carries rollers instead of bushings on the transmission mainshaft, like the Pursang. So the saga of the Alp will continue to unfold every six months, and from it a wholly new concept in off-road riding. A serious bike for the serious non-racer, a mountain machine for mountain men. A good vehicle for semi-skilled riders to break into off-road, and the kind of machine an expert never gets tired of because of the bike's capacity to make him look even better wherever he goes. •

BULTACO 350 ALPINA

TEST BIKE

Engine serial	11800247
Base price as tested	$1395.00
Factory warranty	90 day mfg. defect

ENGINE

Type	2-stroke piston port
Displacement	348cc
Bore x stroke	87mm x 64mm
Claimed HP @ RPM	N.A.
Claimed torque @ RPM	N.A.
Compression ratio	10:1
Lubrication system	Oil mist
Carburetion	27mm Amal
Air filter	Oil wetted foam
Ignition system	Magneto, points, coil
Electrical system	Alternator, no batt.
Starting	Left foot, indirect
Exhaust	Muffler & spark arrestor

DRIVE TRAIN

Primary/ratio	2.37:1 Duplex chain
Clutch	Wet-all steel multi-plate
Transmission/shift	Leftside
Gear ratios	(Internal) 1st 2.87:1; 2nd 1.42:1; 3rd .625:1; 4th 821:1; 5th 1:1
Final drive/ratio (sprocket teeth)	3.23:1 (13/42)

CHASSIS AND SUSPENSION

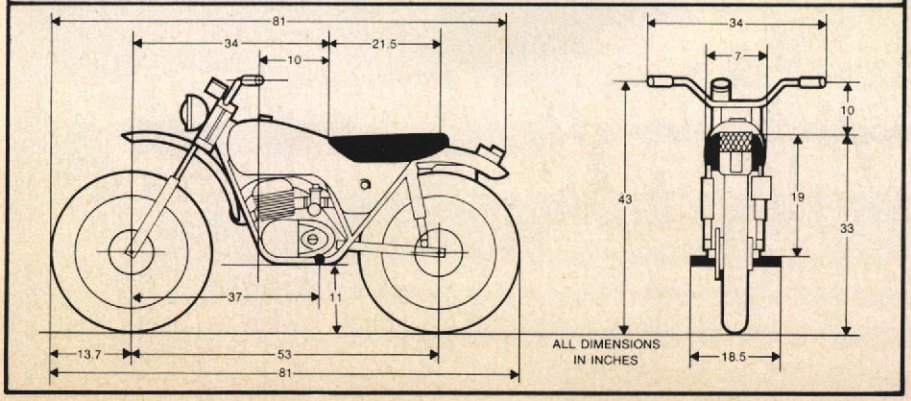
Frame	Single downtube, one-piece chrome moly steel welded structure
Suspension, front	Betor 2-way damped 7" travel
rear	Betor 2-way damped, 5 position adjustable spring
Turn radius	N.A.
Brakes, front	SLS-internal expanding
rear	SLS-internal expanding
Tires, front	3.00x21 knobby
rear	4.00x18 knobby
Rim locks, front/rear	Rim screws

WEIGHTS AND CAPACITIES

Weight, wet, unladen	238
Allowable gross weight	N.A.
Fuel capacity	2.8 gals.
Engine oil	in fuel

STANDARD EQUIPMENT

Speedometer	10th resettable
Tools	Yes
Stands	R/H side
Passenger provisions	No



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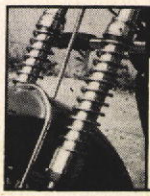
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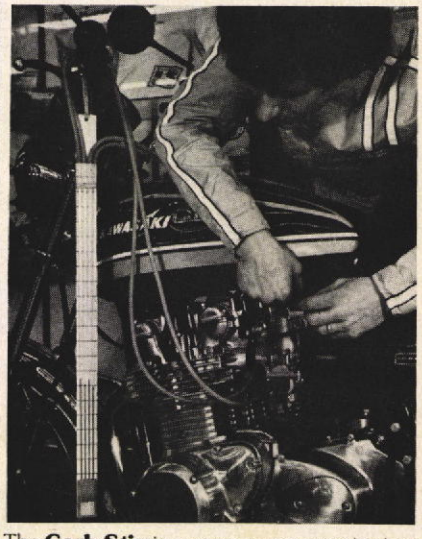
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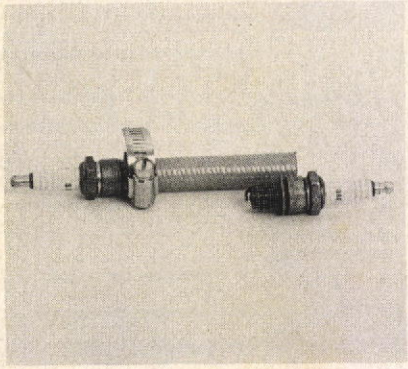
tech tips

PLUG TOTER

A quick and easy way to carry a couple of spare plugs on your off-road cycle is probably sitting around your work shop right now. An old piece of tubing or hose with the



same i.d. as a plug can be hose-clamped to your frame tube or handlebar brace and the plugs threaded into it. The spark plugs will make their own thread, making sure that they stay in place. It works.

JIFFY PULLER

Factory tools are expensive and at times hard to come by. Most Japanese machines need a special puller to remove the electrics, whether it is a generator or mag type ignition. A quick and easy solution is to hack

up an old spark plug, which has the same thread pattern as the center of your mag, and then tap a 10mm thread on the inside. This will act as the actual puller when the plug end is screwed into the ignition housing. It works.

QUICK RE-SET

How many times have you been out on an enduro and had to waste time re-setting the trip speedo back to zero because you couldn't find the knob? It happens constantly and when you are trying to make up lost time, but still keeping track of where you are, it can be a real hassle. A short piece of sturdy gas line can

be the perfect solution. Just force it over the end of the re-set knob and leave an inch or two as a handle. Just reach down and it is at your fingertips.

next month

How do the 175 ENDUROS FROM JAPAN compare? Honda, Kawasaki, Yamaha & Suzuki slug it out in the March issue of Motorcyclist

Plus: Exclusive test of sleek, all-new 500cc BENELLI QUATTRO four-banger!

plus, plus, plus
360 Yamaha Enduro Project Bike,
How-To-Troubleshoot, and a lot more! Get your March issue of Motorcyclist, on sale February 13th.

The first person to ever ride a Hodaka 100 Dirt Squirt™ came back giggling about wheelies, jumps, sliding, etc. The second person to ride it was soon to coin the phrase "Fun Hundred." Chances are, if he hadn't, the third rider would have.

Why?

The Dirt Squirt has a low seat height so that you feel like you are part of the bike -- not like you are perched on top of it. The Squirt's light weight, proven frame geometry, low center of gravity, knobby tires and two-position shock absorbers add up to one of the best handling motorcycles on the market.

Power. Unlike some engines with power that comes on at high RPM's, the Hodaka's 100cc five-speed engine offers smooth, predictable power...over a broad RPM range. It's an engine that can go slow as well as fast. You can literally walk alongside the Dirt Squirt and it won't stall. With this kind of control, riding is pure pleasure.

The Dirt Squirt requires little maintenance and most repairs can be made with a few simple tools. You don't have to spend a lot of time keeping the Dirt Squirt in running condition, which means you'll have more time to ride it.

With almost unlimited versatility (by virture of its Hodaka heritage, the Dirt Squirt is able to accept hundreds of bolt-on options that can transform the basic "Squirt" into a motocrosser, enduro, etc.) the Hodaka 100cc Dirt Squirt can be about anything you want it to be. Just another reason why we call it the "Fun Hundred."

FOR MORE INFORMATION about Hodaka Motorcycles, look in the yellow pages for the Hodaka Dealer in your area...Or send your name and address, plus 25¢ (to cover cost of postage and handling) to the address below and we will send you a copy of the "Hodaka Story" and direct you to your nearest Hodaka expert. Canadians: Gemini Ind., 2525 Stephens St., Vancouver B.C. Australians: Sport and Road Pty., Ltd. P.O. Box 37, S. Melbourne, Australia 3205.

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Some of the people who buy the Dodge Tradesman van aren't even tradesmen.

Some of them are people like you. People who chase the biggest waves or the toughest hills—or maybe just the warmest sun—in a solid hard-working Dodge Tradesman van that's made to play just as hard as it works.

What makes the Tradesman ideal for vanners? A lot of of the same things that make it ideal for carpenters and plumbers. Things such as our choice of dependable Dodge engines. A choice that begins with our famous 225 Slant Six (smallest displacement engine offered in any American van) and offers you two V8 engine options for extra power, if you need it. Electronic Ignition System to keep the Tradesman out of the shop and on the road—running like new longer. Optional AM/FM radio. And a choice of van sizes that includes the big Maxivan—the biggest van in the field. With room for surfboards, dirt bikes, or even some simple comforts of home.

That's the Dodge Tradesman van . . . built to get the job done. Even if the job isn't a job at all.

Dodge
Dodge Trucks

EXTRA CARE IN ENGINEERING MAKES A DIFFERENCE.
DODGE TRUCKS. DEPEND ON 'EM.

The basic van comes from Dodge. Custom touches such as porthole window, "mag" wheels, fat tires, sidepipes, and paint trim are available through custom shops.